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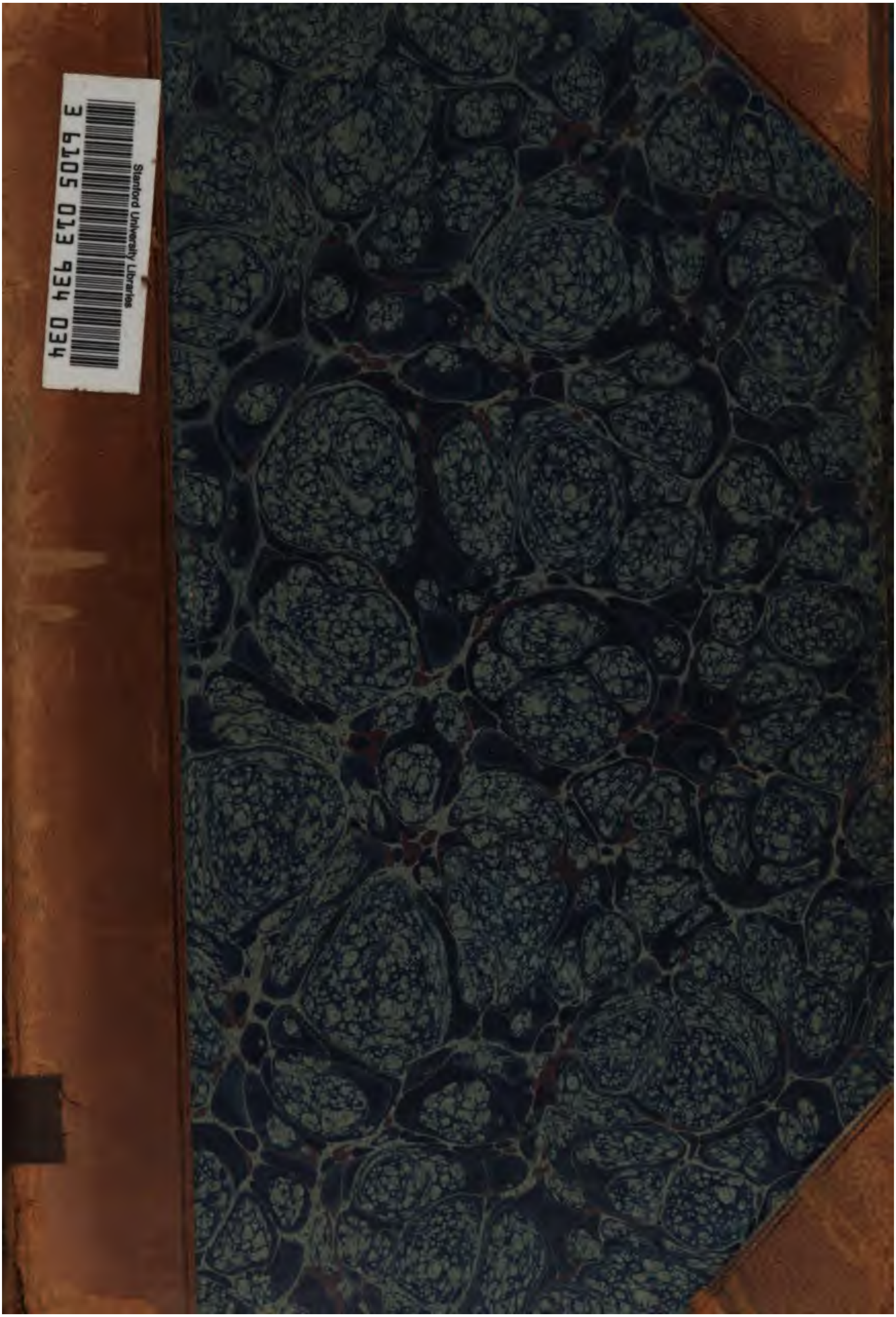

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ROBERT ADKIN, F.E.S.
T. R. BILLUPS, F.E.S.
W. LUCAS DISTANT, F.E.S., &c.
EDWARD A. FITCH, F.L.S., F.E.S.
MARTIN JACOBY, F.E.S.
W. F. KIRBY, F.L.S., F.E.S.
J. H. LEECH, B.A., F.L.S., F.E.S.
DR. D. SHARP, F.R.S., F.E.S., &c.
G. H. VERRALL, F.E.S.
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VARIETIES OF *ARGYNNIS EUPHROSYNE* AND *MELITÆA AURINIA*.

BY F. W. FROHAWK, F.E.S., AND R. SOUTH.

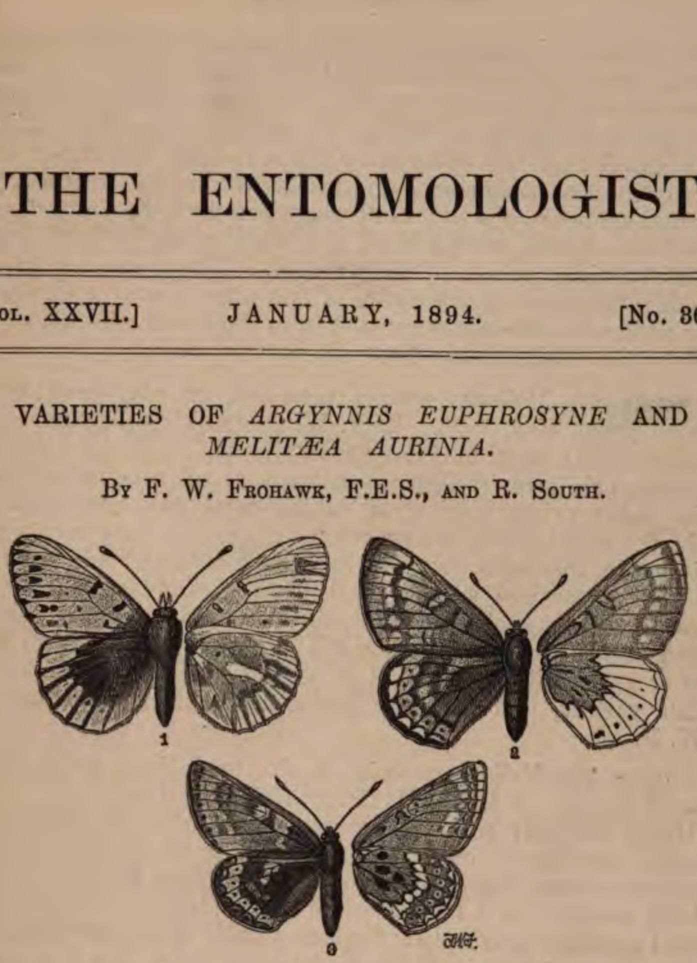

FIG. 1. *Argynnis euphrosyne*, ♂ ab. FIG. 2. *Melitæa aurinia* (*artemis*), ♀ ab. FIG. 3. *Melitæa aurinia*, ♂.

FIGURE 1.—*Argynnis euphrosyne*, ♂ ab., captured May 5th, 1893, in Lancashire, by Mr. T. Baynes, in whose collection the specimen now is.

Fore wings pale fulvous, blackish at the base; there is an elongate black spot at the outer extremity of discoidal cell, one about the middle of the cell, and one below this last in the submedian interspace; the submarginal area is traversed by a series of six blackish spots, the second to fifth of which are more or less elongated, and the sixth double and ill-defined; marginal line black, preceded by black triangular spots on the nervules. Hind wings: basal two-thirds black, the centre clothed with long pale fulvous hairs; outer third pale fulvous, intersected by black nervules. Under surface of fore wings paler than above, especially at apex and along outer marginal area; spots in cell as on upper surface, but on the submarginal area the spots are obscure reddish brown, the two upper ones most conspicuous and projected to outer margin; the marginal spots are absent: hind wings pale buff, the outer third limited by a waved reddish line; the nervules are bordered with reddish on this portion of the wing, and there is a silver patch in each interspace; in the centre of the wing is a large elongate silver spot, which is only separated from the fourth internervular patch by the reddish wavy line.—R. S.

FIGURE 2.—*Melitæa aurinia* (*artemis*), ♀ ab., bred from Penarth pupæ, May, 1893. In F. W. Frohawk's collection.

Upper side: basal half dark smoky brown; apical portion of primaries pale straw-yellow; semitransparent in certain lights. Under side: primaries with a submarginal pale straw-yellow band; the usual tawny orange colouring is much deeper in tone, inclining to russet-brown; the secondary on right side has the usual tawny orange submarginal band entirely missing, the series of black spots only remaining on the creamy white ground; on the left side the band is slightly indicated; the five basal creamy white spots found in normal specimens are absent in this variety, and partially replaced by black markings.—F. W. F.

FIGURE 3.—*Melitæa aurinia*, ♂ ab., bred May, 1893, from Penarth pupæ. In Mr. J. H. Carpenter's collection.

Upper surface: primaries smoky black, without any cream-coloured markings, only the tawny orange spots present; secondaries black, the submarginal band and median markings in bold contrast to the black ground. Under side: resembling normal specimens, excepting the basal area of the secondaries, which are somewhat similar in variation to fig. 2, but in a more marked degree, exhibiting four large deep black spots.—F. W. F.

ON THE VERTICAL DISTRIBUTION OF THE BRITISH LEPIDOPTERA.

By W. HARCOURT BATH.

THE study of the vertical distribution of the Lepidoptera in this country is a by-path of Entomology which has hitherto been very sadly neglected.

So long ago as 1865, Mr. Jenner-Fust published, in the 'Transactions of the Entomological Society of London,' an account of the geographical distribution of the Lepidoptera occurring in the British Isles, on similar lines to those laid down by Mr. H. C. Watson, in his excellent work on the geographical distribution of the flowering plants, well known to British botanists as the 'Cybele Britannica.' The author, however, does not treat whatever of their vertical distribution (which is no doubt owing to the paucity of data bearing upon the subject), nor has anyone else attempted to do so since, that I am aware of.

Now vertical distribution is, in my opinion, in every particular as important as geographical distribution, for it estimates the affinities existing, on the one hand, between the lowland species occurring in this country and their relatives in more elevated areas in the South of Europe; and, on the other hand, between the montanic forms found in these isles and their representatives occurring at still higher altitudes in the alpine regions of the central and southern parts of the Continent, as well as at lower levels in arctic and subarctic latitudes.

Vertical distribution, besides, gives a better index as to the range of temperature and other climatic phenomena which each species can endure than mere geographical distribution is capable of doing in anything like the same area. For instance, there are greater differences of temperature found in ascending a hill only some 3000 feet in altitude, than there exists between the Scilly Isles and the extreme north of the Shetland Isles, which are distant from one another about 700 miles. On the average, the distance afforded by two degrees of latitude (*i. e.*, 139 miles), either in a northerly or southerly direction, is capable of producing only a difference in the mean annual temperature of about one degree Fahrenheit, which a trifling ascent or descent of a hundred yards will do upon the side of any hill. This is well exemplified in Mr. H. C. Watson's celebrated 'Cybele Britannica' previously alluded to.

Although Mr. Watson's geographical divisions (employed by Mr. Jenner-Fust) are in the main probably the most natural provinces which could possibly have been decided upon, his vertical divisions or zones do not seem to be so well suited for studying the ascending limits of the Lepidoptera in this country as some which I shall suggest.

The brothers Speyer, in their great work on the distribution of the Swiss and German Lepidoptera, define five vertical or ascending zones as follows:—

1. *The Lowland zone.* This includes all the valley region up to the limit to which the walnut and sweet chestnut will grow. In the southern alps it terminates at about 3000 feet above the level of the sea; in the northern limestone alps it is somewhat 500 feet lower; and 1000 feet lower still in Central Germany (in the region of the Schwarz Wald, or famous Black Forest).

2. *The Hill zone,* which is the next in the order of ascending,

terminates respectively in the south alps, the north alps, and Central Germany, at the heights of about 4500, 4000, and 3000 feet, and is the highest limit at which the oak, beech, and birch trees will flourish.

3. *The Lower Alpine zone.* This is the great region of coniferous trees, and runs up to the height of 6000, 5500, and 4500 feet in the three mountain districts mentioned above. In Norway it terminates at the height of from 700 to 3000 feet, according to the latitude.

4. *The Upper Alpine zone.* This belt extends above the pine trees to the additional height of 1500 feet, and is the region of the rhododendron, great tracts of which occur in the Swiss alps, making this part of the mountains quite bright with their millions of blossoms in the summer time. In Scandinavia this belt is very vaguely represented, the width being often reduced to very trivial dimensions.

5. *The Snow zone.* In this zone only small alpine plants and lichens flourish, and it extends up to where the first great patches of the everlasting snow are encountered, which is sometimes several hundreds of feet beyond the theoretical line of congelation.

Now, in deciding the limitations of the zones in the British Isles, I have been guided largely by the preceding plan, and have, as far as possible, given the exact British equivalents for each of them. My proposed list is therefore as under:—

1. *The South Coast zone.* This belt coincides with the lower portion of Speyers' lowland zone, and corresponds to the limit in Europe to which the grape-vine will flourish, which terminates polewards at the annual isotherm of 50° F., or at about latitude 50° on the Continent. In the British Isles it includes all the southern coasts of England and Wales, from the neighbourhood of Liverpool in the west to Harwich in the east, as well as all the southern portions of Ireland. Its southern limits are in the Scilly Islands, which possess a mean annual temperature of 53° F., and it includes the whole of the south coast up to the average height of about 300 feet above the sea-level. It constitutes the northern limit of the *Clematis vitalba.* Several Austral species of Lepidoptera are found exclusively in this region; but the only species of butterfly which can be said to belong to it alone is the little Lulworth "skipper" (*Hesperia actæon*). I think it is necessary to provide this zone, as an unfair value would, if it was omitted, be attached to the one which immediately follows in the order of ascending, and with which it would otherwise be incorporated.

2. *The Lower Hill zone* corresponds to the remaining half of Messrs. Speyers' lowland zone, and terminates in this country at the annual isotherm of 45° F. It constitutes by far the most extensive belt in the British Isles, embracing the greater part of the country within a moderate vertical distance of the sea-level,

north, or above that, of the preceding zone. To it accordingly belongs the great bulk of our indigenous Lepidoptera. In the South of England this zone extends to the height of about 1800 feet above the sea-level; but in the North of Scotland it sinks to as low as 300 feet. No very familiar or typical botanical productions may be enumerated as belonging exclusively to the Lower Hill zone in this country.

3. *The Upper Hill zone* is the British equivalent for Speyers' 2nd or Hill zone, also of Watson's super-agrarian zone, and terminates at the isotherm of 41° F. It constitutes the highest (or most northern) limit to which grain can be cultivated, and it is likewise the point at which the oak and the common bracken (*Pteris aquilina*) cease to grow. In the Grampian mountains it terminates at the height of 1800 feet above the sea-level, but in the Snowdonian range of North Wales it is somewhat 1000 feet higher. By reason of its greatly reduced extent in this country, this zone only contains a small proportion of the species of Lepidoptera found in the preceding zone. *Erebia epiphron* (var. *cassiope*) is the sole species of butterfly which exclusively inhabits this zone, and it is the only true alpine species of Rhopalocera which we possess in the British Isles. It does not, however, here ascend, comparatively, to anything like the height that it does in the mountains of Central Europe, where it exists in Speyers' pine or Lower Alpine belt.

4. *The Lower Alpine zone* corresponds to the zone of the same name defined by Messrs. Speyer, but from its very circumscribed extent it only possesses comparatively a small number of species of Lepidoptera, although several species of butterflies are known to breed within its boundaries. In England and Wales it only contains a few mountain summits within its limits from the height upwards of about 3000 feet, but in Scotland it constitutes a much more extensive area in the Grampians, where it rises to the height of about 3300 feet, terminating at the annual isotherm of 36° F. This zone constitutes the highest limit to which the heaths will grow, *Calluna vulgaris* being the last species to succumb to the increasing cold. In Switzerland, Germany, and Scandinavia, it is the highest altitude at which the various species of pine will survive, but the Scotch fir (*Pinus sylvestris*), which only grows to the height of 2100 on the Grampians (and therefore only just enters the present belt), is of no value in estimating the British equivalent for the zone in question, as this tree is known not to reach to nearly so great an altitude as several other species of the Coniferæ, to which it belongs. I have, therefore, been compelled to adopt the common heath as the typical plant of this belt or region.

5. *The Upper Alpine zone* is of still more limited extent than the preceding one, containing only the summits of the highest of the Grampian mountains (from about 3300 feet above the sea-

level). It terminates theoretically at the height of 4500 feet, or the theoretical line of congelation. Ben Nevis, the highest mountain in the chain, however, falls short of this altitude by about 100 feet. This belt constitutes the 4th or Upper Alpine zone of Messrs. Speyer, and is characterised in this country by possessing a flora composed only of small alpine plants and lichens, there being nothing in the Grampians corresponding with the lovely rhododendrons of the Swiss alps. The 5th or Snow zone of Messrs. Speyer is not represented at all in the British Isles, this being the region between the theoretical and the actual snow-line of the high mountains upon the Continent.

(To be continued.)

EXTRACTION OF MOTH-GREASE BY ETHER.

By H. Guard Knaggs, M.D., F.L.S.

Some months since there appeared in your pages an interesting discussion on the removal of grease from moths, in which Messrs. Christy, Arkle, Anderson, and the Rev. Joseph Greene took part; and it seemed to me that a considerable advance had been made by the former gentlemen towards thoroughly extracting the grease without showing any external blemish. But while agreeing with Messrs. Christy and Arkle as to the efficacy of repeated baths of benzine or benzoline to eradicate every particle of grease, thus rendering the insect safe for the future, I would submit that there is a fluid still better adapted for the purpose, namely, ether. Methylated ether is about the same price as benzoline, and consequently considerably less than benzine collas. It has fully twice the insect-grease-solving power of the latter, but its great merit consists in the rapidity with which it volatilises, leaving the pile of the fur in its natural position, and thereby giving a freshened appearance to the specimen.

Breaking off the bodies is a matter of judgment decided by the size of the species, extent of grease, age of the specimen, &c.; it is also a matter of convenience and an economy of time and material, more especially with the larger species from the size of *Noctuæ* to *Acherontia*, for when the abdomina alone are detached they take up comparatively little space, and consequently a larger number of them may be operated upon simultaneously, the bath receptacle need not be so large as with entire insects, and the quantity of detergent fluid may be greatly diminished, but not stinted. With regard to the time for commencing operations, it seems to me that we should never begin until the insects are thoroughly set and dry, even though signs of grease may be present; but that, in a reasonable time after that, the sooner any examples exhibiting abdominal stains, or indeed any of the numerous species which are bound to go wrong, are taken in hand the better.

A small scoop, of a size proportionate to the insect to be operated upon, will be found advantageous in the case of specimens which are recent or comparatively so. Its use is to make a channel from the thoracic to the tail-end of the abdomen, for which purpose it is inserted into the thoracic end, pushed as far as it will go, and then gently withdrawn again, the object being to give the ether free access to the whole length of the interior. This procedure may not be absolutely necessary, but it greatly expedites the removal of the objectionable matter. Note.—Of course the greater part of the contents of the abdomen might be extracted by the scoop alone, without exhibiting any outward sign, but, as the ether will do the work rapidly and completely, there is no occasion to take the trouble. Old bodies with hard interiors may be drilled from diaphragm to anal end to admit the fluid.

As a bath receptacle nothing can be better than a bottle of the shape recommended for benzine by Mr. Christy, but for ether a *perfectly-fitting* stopper is a *sine quâ non*. This, in my plan, is fitted with an oblong cork stage, of a width to enter the mouth of the bottle easily, and of a length shaped to fit the internal diameter loosely; it is loaded with two strips of lead, and a small cork float is attached, by a tether of about half-an-inch, to one of the ends by means of pack-thread. Cork is used (*pace* Mr. Anderson), because it is, in my opinion, important to keep the insects and bodies from touching one another or the stage. As for the rest, pin the specimens, &c., on the stage (the ticket numbers may be written in ordinary ink, and if they are submerged even while the writing is wet, and kept in the fluid for months, they will take no harm), then lift the cork stage by the float, and lower it gently into the bottle, till its base rests flatly on the bottom, cover the insects, &c. with ether, replace the stopper, and put away in a cool place, for warmth does not suit ether at this stage of the proceedings.

The duration of the bath will depend upon the size of the insects and bodies to be operated on; if large, as from an average *Noctua* or *Bombyx* upwards, they may be left from six to ten days; if smaller, half the time may be enough. At the end of that period open the bottle, grasp the cork-float with a pair of forceps, gently lift out the stage, and lay it, loaded side down, on a plate; then pour off the liquor into a narrow-mouthed bottle and cork tightly, wipe out the bath-bottle, replace the stage, replenish with fresh ether, stopper, and put away for another period, by which time the cleansing will probably be completed; but it is advisable to give a third short soaking as a rinse to wash off any surface grease. Note.—If the fluids of the first and second soakings are bottled together, and allowed to settle, the clear top liquid may be used again and again as a *first* bath; that of the third bath may be put aside for a future *second* bath.

The drying process may be commenced as soon as we are satisfied that the insects, &c. are thoroughly cleansed, as evidenced by the non-discoloration and absence of turbidity of the last bath, and by the "feel" of the interiors of the bodies as we draw the scoop along their sides. Lift out the stage, and *at once* place it in a thorough draught, such as that caused by raising the lower sash of a window a few inches; or, better still, find a warm corner with a temperature not over 80°, where there is no flame; or have a foot-warmer of hot water ready, lay the stage upon its flat surface, and fan away in order to accelerate evaporation, for it is upon the quickness of the drying that the future fresh appearance of the specimen depends. Absorbent powders will not be required unless the insects are taken out of a greasy medium. Perhaps from the first to the last of the process described a week or even a month may elapse, but the aggregate of the actual attention required may hardly exceed half-an-hour, with which short expenditure of time dozens of specimens can be rendered safe from any return of grease for ever, or at any rate till they perish from lapse of time, or other cause. The foregoing remarks apply more particularly to entire insects of small or moderate size, and to abdomina of all sizes.

The wings and thoraces of the larger species—too big for the bottle—are the next things we have to consider, and these require a different treatment to that already mentioned. As far as the former are concerned, if the thoraces are not bad, the best thing to do seems to be to put a quantity of one or other of the powders generally used for the purpose into a saucer, and, having shaped the surface to fit the insect, press the latter on it; then saturate it thoroughly by dropping ether upon it, and quickly cover over with more powder, very gently tap the bottom of the saucer against the table in order to cause the powder to settle closely round the insect, and also to render the head of the pin visible, and put away for twenty-four hours. With two or three repetitions of this procedure the specimen will usually be found free from grease; the powder may be shaken and blown off, and, after a brush up with a camel's-hair pencil, blowing the while, the fur of the specimen may be freshened up by a light spraying with ether, while rapid evaporation is kept up by fanning. It is surprising how quickly and easily greasy butterflies may be furbished up in this way. But beware of a flame or naked light while at this work, for the injunction about benzine and inflammability applies with even greater force to ether. A spray apparatus, the bellows part of which will be useful for preserving larvæ, according to Lord Walsingham's plan, can be procured at a very low figure, if we are content with German manufacture.

Thoraces, if very bad, present a deplorable appearance; if the grease has extended to the pin, a green salt is generated, which so distends and distorts the shape of the thorax that the insertions of the fore and hind wings part company. This is still more exaggerated and unsightly if the specimen happens to have been pinned towards one side. If such an example be immersed in ether, the green salt and grease surrounding the pin will be quickly dissolved, and the specimen will probably float off the pin. In the case of a common species thus affected, it would be sheer waste of time and talent to attempt a cure, but with a rarity it might be worth while, after cleansing it, to detach the abdomen, with hind wings attached, and try the operation of excising the bulging portions of the thorax, in order to approximate the fore and hind wings into something like their natural position; and no doubt, with skill and care, such a specimen might be made to *look* decent.

A word of warning. — "Never mix." If you begin with benzine, keep to it; if with ether, ditto. Do not start with one and finish with the other, or you will regret it.

Should any one wish to know more about ether, I shall be happy to enlighten him to the extent of my ability. The present seems a fitting opportunity to again thank those gentlemen who have so kindly furnished me with the material which has enabled me to complete this paper. I dare say there are,—in fact, I feel sure there must be,—many imperfections in the methods here advocated; but I much doubt if a better fluid than methylated ether can be found for the purpose—*at the price*. I *do* know of other fluids which may be able to give even ether odds in a grease-cleansing match, though most of them are too costly for the purpose—but there! Methylated ether is good enough for the present, and I am morally sure that if any of your readers will only give it a trial, they will be well pleased with the result.

Camden Road, N.W., December, 1893.

ON A COLLECTION OF LEPIDOPTERA FROM THE SCILLY ISLES.

By Robert Adkin, F.E.S.

Contributions, however small, towards a knowledge of the fauna of an isolated district are always interesting. I was therefore glad to accept the invitation of my brother, Mr. Banaiah W. Adkin, to inspect and make notes upon a collection of Lepidoptera that he had made in the Scilly Isles, for the most part during a summer holiday extending over portions of the months of June, July, August and September, 1893; but for the purposes of these notes some few species that he had obtained during shorter visits in other years are incorporated.

The Scilly group consists of some half-dozen larger islands, the largest of them being about three and a-half miles across at its extreme points; about thirty smaller ones, and innumerable rocks and ledges; and are composed entirely of a coarse type of granite, a continuation of that running through Devon and Cornwall. They are situate 27 miles W.S.W. from the Land's End, and are contained in an area of some 30 square miles of sea-room. The climate is mild and humid, and the range of temperature small, the difference between the mean summer average (58° F.) and that of winter (45° F.) being only 13 degrees; but by reason of their exposed situation, the islands are subject to rapid changes of weather and frequent storms; and it is probable that only the half-dozen larger ones, of which by-the-bye five only are inhabited, afford sufficient protection to shelter anything beyond sea-birds and lichens, both of which, however, abound throughout the group.

St. Mary's, the island on which the collection now under notice was chiefly made,* is much the largest of the group; it consists of a mainland connected by a sandy isthmus, on which is situated the town, with an almost barren hill known as "The Garrison," the whole comprising just over 1500 acres. The main part of the island consists chiefly of elevated rocky land, in many parts bare of any vegetation, attaining at the highest point some 158 feet above sea-level, and intersected by two swampy valleys, the larger of them, which contains a good-sized fresh-water pond, crossing the island from east to west, the other running in a southerly direction and meeting it at about its centre. The only trees on the island are some fruit orchards, frequently surrounded by wych-elms, and a few small, rather sickly-looking poplars, recently planted in some of the more sheltered parts. An industry, that has of late assumed very considerable proportions, is the raising of early flowers (*Narcissus* and the like) for market; these are grown in fields, chiefly surrounded by hedges composed of *Escalonia macrantha* and species of *Euonymus* and *Veronica*, while others are divided by stone walls. The uncultivated portions of the higher lands, where sustaining any vegetation, are covered with masses of gorse, bramble, and heather; while along the cliff-edges thrift is abundant, and *Silene* scarce and local. The valleys contain large quantities of rushes (*Arundo?*), coarse grass, a few low-growing plants, and many very fine examples of the royal fern (*Osmunda regalis*).

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* Occasional visits were paid to several of the other islands, namely, Annet, St. Agnes, Sampson, Bryher and St. Martin's, and many of the smaller islands, all of which are similar in their natural features to St. Mary's; also to Tresco, where is the residence of the proprietor of the islands, T. A. Dorrien-Smith, Esq., and his gardens, in which subtropical and even tropical shrubs and plants, such as palms, aloes, camellias, prickly-pear, and many others, flourish side by side with the common furze; but in no case was any species observed that was not met with on St. Mary's, nor did any of those taken exhibit forms varying from those of that island.

Under such conditions it is not surprising to find that Lepidoptera are by no means common in the islands, and that one has to work hard to get together even a small collection; but the isolated position of the place and the peculiar climatic conditions, already referred to, would lead one to expect a considerable percentage of variation among the species occurring there, but in this the collection is, with one or two exceptions, very disappointing.

In the following list, where no comments follow a species, it may be assumed that it was comparatively common and the specimens taken quite typical:—

Pieris brassicæ, P. rapæ, P. napi.

Epinephele ianira, the commonest and perhaps the most interesting species met with. A well-defined local form, in which the brown colour of the wings is richer and more velvety than usual, somewhat approaching that of *Erebia æthiops*, and the fulvous patch brighter. In the males this patch is large, and in the extreme examples of the female it also extends, in a subdued form, over a considerable portion of the basal half of the fore wings, and is carried as a broad band across the hind wings. The black spot near the apex of fore wings is large and not infrequently bipupillate, and in several specimens there is a distinct lobe on its lower margin; some specimens have also a fulvous ocellated spot near the anal angle of hind wings.

Vanessa atalanta and *V. urticæ*. *V. cardui*; common in 1892, not seen in 1893.

Chrysophanus phlœas, not particularly common.

Lycæna icarus. Females bluish, closely resembling the Sussex forms.

Macroglossa stellatarum.

Zygæna filipendulæ, common.

Lithosia quadra, eight specimens taken in 1893, not previously observed.

Euchelia jacobææ.

Arctia caia.

Porthesia similis (*auriflua*), one of the commonest species.

Bombyx quercus, fairly common.

Bryophila muralis (*glandifera*). *B. perla* was not met with.

Acronycta rumicis.

Leucania vitellina (2). *L. extranea* (1). (See Entom. xxvi. 327). *L. impura* (2). *L. pallens* (3).

Xylophasia monoglypha (*polyodon*).

Cerigo matura (*cytherea*).

Mamestra brassicæ, not common.

Apamea didyma (*oculea*), common and variable as usual.

Miana strigilis. One ordinary and one with a decided pinkish hue. *M. bicoloria* (*furuncula*), fairly common.

Caradrina quadripunctata (*cubicularis*).

Agrotis puta. *A suffusa*, scarce. *A. segetum.* *A. saucia*, four only. *A. lunigera.* *A. exclamationis*, not common. *A. tritici*, not common.

Noctua triangulum (1). *N. xanthographa;* all the specimens taken were of a reddish shade.

Triphæna pronuba, and its var. *innuba*, equally common. *T. comes*, not particularly common; all those taken were of the ordinary clay-coloured type, several of them having the transverse lines dark brown and well defined. The legend that specimens closely approaching var. *curtisii* were taken here therefore still remains unconfirmed.

Amphipyra tragopogonis, very common.

Mania maura (1).

Xanthia fulvago (*cerago*) (1).

Dianthœcia nana (*conspersa*), from seed-heads of *Silene* collected in 1891 an interesting series was bred, the prevailing characteristic being the extension of the white markings of the central area of the fore wings towards the inner margin, the extreme examples being distinctly of the "*compta*" type. *D. capsincola*, one bred with the above.

Phlogophora meticulosa, very common.

Hadena trifolii (*chenopodii*), very common. *H. oleracea*, all the specimens were of a mottled reddish form.

Plusia gamma, generally common, but not met with in 1893 until the middle of July, when it suddenly became abundant.

Uropteryx sambucaria, fairly common.

Gnophos obscuraria (1).

Hemithea strigata (*thymiaria*), fairly common.

Acidalia bisetata. *A. scutulata*, not common. *A. marginepunctata* (*promutata*), ordinary grey form. *A. imitaria*, not common.

Abraxas grossulariata.

Emmelesia decolorata, fairly common.

Eupithecia pumilata. *E. coronata* (1); and two other worn examples probably representing *E. satyrata* and *E. absinthiata.*

Melanthia bicolorata (*rubiginata*) (6), rather large, costal patch inclined to form broad median fascia as in var. *plumbata.*

Coremia unidentaria, very few seen.

Camptogramma bilineata, very common. The specimens taken have a general tendency to a darkening of the ground colour, and dark transverse lines and a widening of the white lines, giving the insect a very bright appearance.

Cidaria truncata (*russata*), a few worn examples were taken, apparently of a somewhat dusky form.

Endotricha flammealis.

Sphaleroptera ictericana (1), and *Sciaphila conspersana* (6), bred from seed-heads of *Silene* in 1891.

Lewisham, November, 1893.

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. de Vismes Kane, M.A., M.R.I.A., F.E.S.

(Continued from vol. xxvi. p. 345.)

Spilosoma lubricipeda, *Esp.*—Everywhere common throughout Ireland. The only variety I have noticed is where the dots upon the fore wings are strongly marked, and more or less confluent. One taken by Mr. Dillon, in Co. Galway, is the finest I have seen, and the spots have coalesced into a bar.

Spilosoma menthastri, *Esp.*—Extremely common, more so than the preceding. Sometimes obscures the windows of lighthouses on the S.W. coast. In moth-traps is a perfect pest, disturbing and crowding out better species. The spots are sometimes very numerous and large, but sometimes almost obsolete.

The var. *ochracea* sometimes occurs. Roches Point, Cork; and about Belfast (*W.*) not uncommon.

HEPIALIDÆ.

Hepialus humuli, *L.*—Common everywhere, both on the bleakest coast-line and inland. Variable in size; and in the coloration of the female.

Hepialus sylvanus, *L.*—The only report of the capture of this species has been sent me by Mr. Dillon, who took two specimens at Clonbrock. Mr. Birchall's record in the Co. Wicklow proves to be erroneous.

Hepialus velleda, *Hb.*—Very widely distributed throughout Ireland, but somewhat localised. Mr. Watts thinks that those about Belfast district are smaller and brighter than English specimens. My experience is that they vary much, sometimes having the brown a rich russet hue, and sometimes blackish.

The var. *gallicus*, Ld., often almost as common as the type. I have noticed the female of this variety of very great size, and reaching 2 inches 3 lines in expanse. Whether this is always the case or not seems worth enquiry.

Localities: Derry, Donegal, in suitable localities, Belfast, very common (*W.*); Carlingford and Armagh (*J.*); Tyrone and Monaghan, occasional; Cromlyn and Killynon, Westmeath; Farnham, Co. Cavan; Dublin and Wicklow, often plentiful; southwards in Wexford, Waterford, Cork, and Kerry, in varying abundance; about Ennis, Co. Clare; Ardrahan and Clonbrock, very plentiful (*R.E.D.*); Ballynahinch, Connemara, Co. Galway; Co. Sligo, &c. Abundant and similarly distributed as the former. I have noticed it flying in the sunshine.

Hepialus hectus, *L.*—Very local, but widely distributed. I have taken it in a great many counties, but it is easily overlooked. Belfast (*W.*), abundant; in Wicklow on the little Sugarloaf Mt., abundant (*S.*); Killynon (*Miss R.*), Cromlyn (*Mrs. B.*), Westmeath; near Cork; Killarney, Kenmare, Co. Kerry; Renvyle and Ballynahinch, Connemara, at Dalyston, Loughrea, and at Clonbrock (*R. E. D.*), Co. Galway; Altadiawan and Gallagh Wood, Tyrone, abundant. I observed this species in the act of copulating, and as it has been stated that the female flies up to the male, I append the note I made in my diary on the occasion, so that the action above referred to is not invariable. "June 28th, 1888. Saw a female in the herbage shaking her wings incessantly, and at length one of the males hovering near flew down and found her, and immediately copulated, hanging motionless head downwards suspended by the anal extremity, and the vibrations of the wings of his mate ceased. Also saw the males hovering numerously about, and noticed apparently one male fly against another, when they fell together in the herbage."

COSSIDÆ.

Cossus ligniperda, *Fb.*—A local species, not often met with in Ireland. Wicklow, apparently scarce (*B.*); Leixlip (*S.*), Co. Dublin; Charleville Forest near Tullamore, King's Co.; also at Curraghmore, Co. Waterford; and abundant in certain demesnes in Co. Carlow. It is said to infest the trees at L. Inagh, Connemara.

Zeuzera pyrina, *L.*—The only Irish locality is Clonbrock, Co. Galway, where two or three specimens have occurred in the garden (*R. E. D.*). Mr. Sinclair's former record proved to be erroneous.

Macrogaster castaneæ, *Hb.*—Mr. Dillon has a single specimen, which fell into a boat which was being pushed through the reedy margin of a lakelet near Ahascragh, Co. Galway.

COCHLIOPODIDÆ.

Heterogenea limacodes, *Hufn.*—Mr. Dillon took a specimen, in 1892, at Clonbrock, flying at dusk, and again two similarly in 1893; altogether two females and one very dark male. I have never captured this moth; but Newman seems to say that the females were not taken by him in flight. Probably they only fly at dusk.

LIPARIDÆ.

[Liparis similis, *Fues.*—It is curious that Mr. Birchall reports this species and *L. chrysorrhœa* as common in Ireland. I think it must have been a slip of the pen, as they have never turned up in my experience, nor reported by correspondents, with this single exception.]

Leucoma salicis, *L.*—Mr. Birchall reports this also common. The only locality I know is near Ahascragh, where Mr. Dillon reports that he has taken a good many specimens.

[Ocneria dispar, *L.*—Mr. Birchall turned out large numbers of the larvæ among *Myrica gale* on the Killarney bogs. I also did the same on the hawthorns of Col. Cooper's deer-park at Markree Castle, Co. Sligo, which seemed to thrive. No subsequent records of the experiments are available.]

Dasychira fascelina, *L.*—Three larvæ were taken by me on heather in the Bog of Allen near Toberdaly, King's Co., in 1891. All three were stung, but I preserved them for reference.

Dasychira pudibunda, *L.*—This seems to be confined to the southern half of Ireland. It is common in parts of the Co. Galway, at Ardrahan (*Miss N.*), and Clonbrock, a few (*R. E. D.*), and a larva at Galway (*A.*); Glandore, abundant (*D.*). I have taken the larvæ near Kenmare, Co. Kerry, where Miss Vernon found it not infrequent, and near Cappagh and Lismore, Co. Waterford; Mallow (*Bw.*) and Brandon, Co. Cork (*L.*); Co. Wicklow, Tinahely, not rare (*Bw.*), and Glendalough (*K.*).

Orgyia antiqua, *L.*—This insect never appears to be so abundant in Irish localities as it is in England. I have seen it at Rathmines and Kingstown near Dublin, and in sparse numbers it occurs in widely separated localities. Killynon (*Miss R.*) and Cromlyn (*Mrs. B.*), Westmeath; New Ross (*B.-H.*), Co. Waterford; Killarney (*K.*). At Clonbrock it is very numerous; and in the Belfast district it is generally distributed, but not common (*W.*).

BOMBYCIDÆ.

Trichiura cratægi, *L.*—Killarney; but seems a scarce insect (*B.*).

Pœcilocampa populi, *L.*—Distributed throughout Ireland, and fairly abundant in some localities, as at Howth, Co. Dublin, and Favour Royal, Tyrone. Occasionally at Cromlyn, Westmeath (*Mrs. B.*); Tullamore, King's Co.; Lough Arrow (*Miss ff.*) to Roscommon; Clonbrock (*R. E. D.*), Co. Galway; two near Derry (*C.*); Shanes Castle, Antrim (*Bw.*); Armagh (*J.*); Drumreaske, Monaghan; Tinahely, Co. Wicklow (*Bw.*)

(To be continued.)

HYPENA DAMNOSALIS, Wlk.

By John B. Smith.

In the 'Entomologist' for November, 1893, p. 311, Mr. Butler, in an extremely courteous way, calls attention to a supposed mistake of mine *in re* the above species. Mr. Butler is good enough to make excuses for me, suggesting that I was hurried, and also confused by the "Walkerian arrangement, still more confounded by subsequent accessions," and for his kindness I thank him.

Referring to my original notes, I find under *Hypena damnosalis*:—"Type. The specimens are in part *perangulalis*, in part *deceptalis*. The typical specimen is *perangulalis*." I am entirely familiar with *caducalis*, which is a common species with us; and also with *perangulalis* in all its forms, and am not ready to admit that my note is an error. Mr. Butler is probably right in suggesting the identity of *perangulalis* and *deceptalis*, and I stated this same opinion in my Catalogue as follows:—"As a matter of fact, I believe that the two names refer to one species only."

Perangulalis is an exceedingly variable form in size, in colour, and to an extent in wing form. It occasionally becomes fully as dark as *caducalis*, which it then resembles quite strongly. I was myself misled at first, and referring to a series of figures which I had with me, I find that I had written *damnosalis* on one of them and had crossed it out, and had labelled another "*deceptalis, perangulalis, damnosalis*," which accords with my written notes. I cannot accept Mr. Butler's excuse that I was hurried, for in the Deltoid series I was especially well provided with figures to assist me in recognising species, and I was particularly anxious to clear up the synonymy. There is the possibility that I mistook the type specimens; but I am hardly ready to admit it as very likely.

No one who has not seen large series, can have any idea of the extent of the variation in some of our American Deltoids, and I have puzzled over the species of some genera for hours before I was able to decide on the essential characters useful for tabular synopses.

Rutger's College, New Jersey, U.S.A.

NOTES AND OBSERVATIONS.

Notes on Chalcididæ.—Schletterer (Berl. Ent. Zeit. xxxv., 1890, p. 208) gives *Leucospis rufonotata*, Westwood, as a synonym of *L. gigas*, Fabr. This is erroneous, *rufonotata*, Westw., being identical with *miniata*, Klug (Symb. Phys. xxxvii. f. 1). By the rule of priority, *rufonotata* is, therefore, a synonym of Klug's insect. In the same work, Schletterer (p. 175) gives a reference to *L. biguetina*, Jurine, as 'Ent. Monthly Mag.'; this should be 'Ent. Mag.' *Leucospis gibba*, Klug, is a variety of *biguetina*, Jur., the characters said to distinguish it not being of sufficient importance to justify the species. *Leucospis* may be divided into two sections, founded on the length of the ovipositor; *brevicauda*, Fabr., *ornata*, Westw., *cupreoviridis*, Westw., and *ignota*, Walker, are types of the section in which the ovipositor only extends to the apex of the first segment of abdomen.—John W. Shipp; Oxford University Museum.

Catalogue of Irish Lepidoptera.—My friend Mr. Johnson, of Armagh, who kindly supplied me with a list of his captures in Ireland, publishes a notice (Entom. xxvi. 318) of some additional localities I have omitted. May I explain that when I refer to *Argynnis paphia*, for instance, as "existing in almost all the wooded districts," a few localities only are added to illustrate the universal nature of its distribution. *Epinephile hyperanthes*, *Cœnonympha typhon*, *Macroglossa stellatarum*, and *Chærocampa elpenor* are also cases in which it is wholly impossible and quite unnecessary to specify more than a few localities where, for instance, the insect in question is especially common, or to show northern or southern range, or for other analogous reason. I am very glad to hear of *Smerinthus ocellatus* at Armagh. *Trochilium crabroniformis* at Armagh I am responsible for, and not Mr. Johnson, as he states. In Mr. Harcourt Bath's notice of *Vanessa c-album* (Entom. xxvi. 338) a remark occurs which illustrates some of the difficulties which attend a task of expurgation. It commences with the assertion that "in Ireland this butterfly is also very rarely observed." This of course implies that it has been taken here at least twice. Can Mr. Harcourt Bath supply me with any authentic records? The 'Supplementary List' of Birchall contained the one referred to by Newman, namely, of a specimen, thought to be of this species, seen flying at Powerscourt by Mr. Crewe, when in the company of Mr. A. G. More, then Curator of the Royal Dublin Society's Museum, who is a most competent entomologist. Mr. More, many years ago, assured me that the distance was too great for identification, and that he himself took the insect for a very tattered specimen of *Vanessa urticæ*, and I made a memorandum of his statement accordingly. *Syrichthus malvæ* is another error in the same Supplement, which crept into it on the authority of Mr. W. F. Kirby, then of the Dublin Museum, who, finding subsequently that the specimen (contained in a collection now in my possession) was almost certainly English, published a contradiction and withdrawal. I hoped that it would not have been necessary for me to explain seriatim the grounds on which I have omitted many species from the Irish Catalogue. They are set forth generally in the preface (Entom. xxvi. 73), but if any can be reinstated by any author writing on the Irish fauna, it would be always satisfactory to have a verification of the record supplied.—W. F. de V. Kane; Drumreaske House, Monaghan, Dec. 4th, 1893.

Aberration of Thecla rubi.—Mr. R. E. Dillon, of Clonbrock, Ahascragh, Ireland, has kindly sent me for examination a very remarkable example of *T. rubi*. The specimen, which was taken in the beginning of June last, is in rather poor condition, and the fore wings appear to be rather narrower than in typical specimens. The upper surface of all the wings is fuliginous brown, and the under surface is entirely without the usual green coloration; the white macular line or band (in normal specimens rarely well defined, and frequently only represented by one or two spots) is very distinct and regular. The sexual mark is hardly paler than the ground colour, and very obscure. Sometimes in this species the green colour of under surface gives place to a bronzy brown, but this is the only instance I am aware of in which all trace of green is absent.—Richard South; 12, Abbey Gardens, St. John's Wood, N.W.

Occurrences of Second Broods of Lepidoptera in Devon during 1893.

NAME	*1st brood*		*2nd brood*		*Remarks on 2nd brood*
Leucophasia sinapis	4th May	abundant	10th July	scarce	very much smaller.
Argynnis selene	12th May	abundant	13th July	plentiful	smaller and lighter in colour.
„ *euphrosyne*	20th May	abundant	21st July	scarce	do. do.
Pararge egeria	7th April	abundant	1st July	abundant	no difference in size; specimens darker.
„ *megæra*	15th May	abundant	16th July	abundant	do. more ♀ than ♂.
Lycæna icarus	2nd May	abundant	10th July	abundant	do. do.
Macroglossa stellatarum	3rd May	few	18th Aug.	plentiful	more numerous in autumn.
Arctia villica	9th May	abundant	1st Oct.	few	no difference.
Acidalia marginepunctata	30th April	common	20th July	scarce	on the Devon coast, between Seaton and Sidmouth, the Portland form is plentiful in April and May; 2nd brood scarce. On the Dartmoor range the ordinary form only is taken; no spring brood; July brood abundant.
Melanippe fluctuata	20th April	very common	26th July	not common	much smaller.
Coremia designata	21st April	common	30th July	scarce	smaller.
Cidaria russata	16th April	common	24th July	not common	no difference.
„ *silaceata*	20th April	numerous	14th July	numerous	autumn brood seemed to contain more [varieties or forms.
Larentia pectinitaria	30th May	abundant	4th Sept.	very few	I am not sure if this would be considered a 2nd brood or a continuation of the 1st brood, but I have never met with it so late before, nor did I observe any between June and September; smaller in size.

John N. Still; Junior United Service Club, St. James'.

Acherontia atropos.—I had three larvæ of *Acherontia atropos*, nearly full-grown, sent to me, on July 12th, by Mr. Daw, of William Street, Slough. They were found feeding on *Lycium barbarum*, growing against the wall, and partially covering the sitting-room window of his house; one was injured by a fall, and died in a few days. Two went down, the first on July 18th, the other on the 21st. Both produced moths, one on Sept. 20th, and the other on the 28th—fine and perfect specimens. The first measured 4¾ in., and the last to appear 5 in., from tip to tip of wings, when set. It would be interesting to know if the larvæ have been found in a similar situation in other parts of the country. The first example of *A. atropos* I had in my cabinet was found at Slough on Nov. 6th, just over thirty years ago, and so well is it preserved that it might easily be mistaken for one captured within the last two years.—J. B. Williamson; Farnham Common, Slough, Bucks.

Emergence of the Sexes of Himera pennaria.—On April 20th I found a batch of eggs of *Himera pennaria* on an oak-trunk. These hatched in due time, producing forty-four larvæ, of which forty-three pupated, all going down within three days. The following are the dates of emergence, with the sex:—Sept. 20th, two males; 22nd, two males; 23rd, three males; 25th, three males; 28th, two males; 29th, one male. Oct. 1st, one male, two females; 2nd, two females; 4th, one male; 5th, one male, three females; 8th, two females; 9th, one male, one female; 14th, two males, two females; 15th, one male, three females; 16th, two males, one female; 17th, two females; 19th, two females; 20th, one male. Total, twenty-three males and twenty females. The males were all, without exception, well-formed and perfect insects. Of the females, twelve were complete cripples. In eight the wings were fully expanded, but in four of these lacked strength and substance, only four of all the females being really perfect.—N. F. Searancke; Mitcheldean, Gloucester, Nov. 7th, 1893.

Remarks on the Season of 1893.—Early Appearances.—Owing to the almost tropical weather, instances of early appearances have been far too numerous to mention here; on the whole, species have appeared fully a fortnight earlier than usual, in many instances three weeks, and in some exceptional cases even a month in advance of ordinary seasons.

Melanism.—Instances of melanism in specimens captured this season have not been up to the average; a very large number of the Noctuæ and Geometræ (especially the former) which occur in the neighbourhood of York are more or less subject to melanism. A full list of the species which show this tendency, and have come under my observation, will be given at some future date.

Sallows were very unproductive, being well out by March 10th, and doubtless on this account the generally seductive blossoms failed to attract the Tæniocampidæ in anything like their usual numbers.

Sugar.—Whilst we have had very few poor nights at sugar, the quantity has rarely been great, and the quality invariably poor. The reason for this has been, in my opinion, not the counter-attraction of honeydew, at which I have noticed very few moths, but the general scarcity of *Noctuæ*.

Ivy-blossom.—On Sept. 30th I had my first night at ivy-blossom, in the Westwood Beverley, where the ivy is especially abundant, clinging in wild luxuriance around the fine old hawthorn trees, which here form such a conspicuous feature of the landscape; but, although the night was favourable from a meteorological point of view, the blossom fine, large, and plentiful, and the odour perceptible even to human nostrils, our would-be guests failed to put in an appearance, except by ones and twos,—quite different to the nights at ivy-blossom one often reads about. A friend of mine, who has worked ivy on numerous occasions this season, informs me that he has had almost uniform bad luck.

Geometræ have been on the whole very scarce, and mothing at and after dusk uniformly unproductive. In the daytime, at rest on tree-trunks, palings, &c., but especially the former, *Tephrosia biundularia* and its var. *delamerensis*, *Venusia cambricaria*, *Asthena blomeri*, *Lobophora lobulata*, *T. punctulata*, *A. sylvata*, *Abraxas ulmata*, &c., have been fairly common; whilst *H. marginata*, *Thera variata*, and *F. piniaria* could be obtained in abundance by means of the beating-stick.

Scarcity of Lepidoptera.—I think this has been due in a great measure to the extraordinary abundance of their natural enemies, ichneumons, wasps, dragonflies, and bats, which, together with swifts, nightjars, and other insectivorous birds, have, thanks to the fine weather, been enabled better to follow their work of destruction; and lastly, but by no means least, to the great drought which has prevailed; these causes having also undoubtedly tended to minimise the number of larvæ, which have been unusually scarce.

Second Broods.—The following species of Noctuæ, which are not usually double-brooded with us, have this year been either double-brooded or partially so:—*Leucania pallens*, *Acronycta psi*, *A. rumicis*, *Noctua plecta*, *N. c-nigrum*, *Agrotis segetum*, *A. suffusa*, *Hadena suasa*, and *H. oleracea*.—W. Hewett; Howard Street, York, Nov. 11th, 1893.

Macroglossa stellatarum and Colour. — Unusual summers seem to bring out unusual insects. During the wettest summer I ever remember, eleven specimens of *Vanessa antiopa* were taken in Berwickshire; and during the early part of another hot summer, twenty-three examples of *Colias edusa* were captured in the same county. I greatly hoped that the species would breed there, and be found again in other years; but from that day to this I have never heard of either having been taken or even seen again. The past summer may be said to have been a great one for *M. stellatarum*. Several of our members have taken the species, and it has been seen or captured in many other places. I have twice seen it, but did not effect a capture on either occasion; and I am glad I did not, as I learned more of the habits of this species during the quarter of an hour I watched it than I had done from all that is written about it in the books that I have read. I was working in a garden one day, when, happening to look up, I saw something flash past me and fly away over the wall. I guessed at once what it was, and thought it was likely to come back again, which it did; and this time I was more fortunate, as I was able to get quite close behind it. The wings were vibrating so quickly that you could scarcely notice them moving at all, and the long hairs on its body stood straight out all round along each side and across behind the body, making it more easy for the wings to bear it up. It did not alight upon a flower, but just inserted its long trunk while on the wing; and as it flew from flower to flower the trunk protruded an inch or more. The most curious thing was the way the moth selected flowers of a particular colour. There were two rows of Violas about ten yards long, one on each side of a walk three feet wide; the insect at once chose a sort of cream- or straw-coloured one, known as "Pilrig-park," and completely ignored all the other colours, such as blue, purple, black, and yellow. It went to work in a very systematic way, beginning at one end of the walk, where the Viola "Pilrig-park" was growing, and going over most of the flowers, but never even trying one of which the edges of the petals were turned up, showing that the flower had served its purpose and was beginning to decay; but it went over every flower that was fully open, or even beginning to open; and after it had been along the whole line it turned back and tried them again, but quickly recognised the fact that there was nothing more to be got out of them. The eye could scarcely follow the insect now, as, after it had tried three or four flowers, it made two or three wide circles; then it tried the common marigold (*Caltha segetum*), but this did not suit it at all, as it only sampled one flower; then it made another circle, flew over the wall, and I knew I had seen the last of it. Now, what can there be about this particular Viola more than any other to attract *M. stellatarum?* The purple, lilac, and black shades seemed all equally good, and yet the insect never touched one of them. There is no doubt that the "Pilrig-park" variety has a vigorous constitution, coming earlier into bloom than many other Violas, and also holding on longer; but even this very thing would give it its robust habit. All the flowers the insect visited would be cross-fertilised, and if I had gathered the seed from these cross-fertilised flowers they would have had a more vigorous habit than the parent plant, or the self-fertilised flowers which the insect rejected. I know that *M. stellatarum* visits single geraniums, too; but here there was a whole bed of double ones, and it never even looked at them. Mr. Speirs caught a specimen while at his window-box of pale pink single geraniums; and I saw one at a scarlet variety, also in a window. (Abstract of a paper read before the South of Scotland Entomological and Natural History Society, October 5th, 1893, by Mr. Shaw, President.)

The Melanism Controversy. — Mr. Dale, quoting my statement that I do not know of any Rhopalocera in the British Islands remarkable for melanochroic tendencies, seems to overlook that I refer to Rhopalocera only, and that my remarks were *apropos* to the suggestion that in countries with defect of sunshine (such as the British Islands) dark coloration would be advantageous, and consequently fostered by natural selection. That theory rests on a wholly different basis from that underlying the well-known phenomena of adaptive coloration, which therefore were not alluded to. My limited knowledge of the Rhopalocera certainly, so far as it goes, quite bears out Mr. Dale's opinion that the Rhopalocera are not without examples of pale varieties on chalk and limestone soils. But I can only call to mind a few such. By Mr. Dale's reference to instances of animals adopting a white uniform in snowy regions, I gather that he rather dissents from Lord Walsingham's theory. It is worth while mentioning, in relation to the subject, that I have often noticed the rapid absorption of the sun's rays by a dark or strongly-coloured insect, strikingly shown when one settles with expanded wings upon the snow; for if they rest any time, the snow melts beneath them, and they perish benumbed by the cold. I have watched this result, and have taken some good species thus upon the Swiss alps.—WM. FRAS. DE V. KANE; Drumreaske House, Monaghan, Ireland.

DISTRIBUTION IN BRITAIN OF VANESSA C-ALBUM.—I was much interested in reading Mr. Harcourt Bath's remarks on the range of this species in Britain (Entom. xxvi. 338), and note that its occurrence in Scotland appears to be doubtful. Barron Wood, in Cumberland, is distant from the Scotch border about fifteen miles as the crow flies, and it was there that my father took a hybernated specimen in April, 1835, when he was collecting *Brephos parthenias*. No other specimens of *V. c-album* were seen there until 1846, when some numbers occurred. A man, now living at Carlisle, was with me at the time, and we found a great many chysalids on the large scabious (*Knautia*), and the butterflies in plenty. A few were found some two or three years later, but, so far as I know, none since. It seems strange that some butterflies, common in adjoining counties, do not appear able to establish themselves in the district referred to, e. g., *Leucophasia sinapis*, *Gonepteryx rhamni*, *Argynnis adippe*, *A. paphia*, *Pararge egeria*, &c.—J. B. HODGKINSON; Preston, December 4th, 1893.

OBSERVATIONS ON VANESSA C-ALBUM.—Since penning the remarks which appeared in the last issue of the 'Entomologist' (xxvi. 338–342) I have had serious misgivings as to whether the conclusions arrived at therein, concerning the dimorphic tendencies of the insect in question, are correct. Upon a careful re-examination of the long series of this species in my possession, I am strongly tempted to think that what I considered to be the typical form of the first flight are merely hybernated specimens of the autumnal brood. But if this is so they must retain their colour and fresh appearance remarkably well; and what is more misleading still, is the fact that they co-exist with the fulvous form. However, I will await the verdict of those who have had greater experience with the butterfly than myself. If my conclusions were incorrect no harm can have been done; and the same object will have been gained by the publication of the epistle which I had in view when I penned it, if it is the means of directing the attention of other students to the various problems connected with the economy of *V. c-album* which require a satisfactory solution.—W. HARCOURT BATH; Birmingham, December 23rd, 1893.

RELAXING INSECTS.—1. If small, lay them between fresh cabbage-leaves for a day or two. 2. Fill three-parts full a wide-mouthed bottle or jar with laurel-leaves, young, and gathered when free from damp. The cork stopper must be air-tight and well sealed. Pin the insects to the bottom of the cork for two or three days. This method does well for Noctuas. By using the above methods no "mould" need be feared. In the two following, this fungus enemy is certain to appear after some hours, whether the water used be hot or cold. Therefore add a few drops of carbolic acid, which will also arrest decomposition, and be certain death to "mites" as well. 3. Use a corked, zinc relaxing-box. Damp—but only damp—the cork. Drop on the cork six drops of carbolic acid. 4. Fill a wide-mouthed, well-stopped bottle or jar, three-parts full with *damp* sand. Drop on the sand carbolic acid, twelve or fifteen drops to a pint (four gills) of sand. Place a layer of cotton-wool on the sand, and lay the insects on the cotton-wool. It is well to measure the carbolic acid—a drop or two over will not matter. Too much will retard relaxation, probably because the oily nature prevents the damp from rising. Nos. 3 and 4, especially No. 4, are invaluable for the largest-sized insects (or, indeed, any other). These may be safely left for a week or a fortnight until thoroughly flexible. Lepidoptera, after relaxing, should be exposed in the room for a few minutes to dry the wings. In changing the pin press the thorax, from below and upwards, with the thumb and fore-finger, then downwards with the use of a setting-needle. After setting, expose the insects for a quarter of an hour in front of a moderate fire. J. ARKLE; Chester.

[For relaxing insects on a larger scale, see Entom. xxv. 119.—ED.]

SPILOSOMA MENDICA var. RUSTICA.—Referring to Mr. Kane's notes (Entom. xxvi. 344) on *S. mendica* var. *rustica*, as probably I was the first to rear this variety from ova, it may be well to record that my capture of the female alluded to took place in 1885. From these ova a most beautiful and varied series of males was bred, fifteen distinct and very striking varieties of which are still in my collection. The ova from which Mr. Adkin and Mrs. Hutchinson bred their specimens were deposited in 1886 by the progeny of the female taken in 1885. The female *rustica* is larger than English specimens I have taken in Durham and Dorset, and more constant in the number and disposition of the spots. I have not observed *S. mendica* here, although *S. fuliginosa* is not uncommon.—H. McDOWALL; Nashville, Howth, December 4th, 1893.

BLEACHED PATCHES ON WINGS OF BUTTERFLIES.—Amongst a few pupæ of *Vanessa atalanta* of the second (or third) brood (the last emerged November 27th), one met with an accident that I thought must be fatal. It hung to the cover of a jar, and in replacing the cover, rather a heavy one, this pupa was carelessly pressed between the cover and the lip of the jar, remaining so for twenty-four hours. The lip of the jar, some tenth of an inch thick, left a deep impression across one of the wing-covers. This got shallower, but remained evident till the time of emergence, and crossed the red band of the upper wing. The butterfly nevertheless succeeded in emerging perfectly, except a white bleached patch across the red band of the upper wing, and some less evident change of the same character on the lower wing. Remembering that *E. ianira* presents these bleached patches perhaps more frequently than any other butterfly,—they are indeed common in that species,—it seems to me that a similar cause, pressure on the pupal wing-cases, is here the explanation also. *Ianira* pupates in a flimsy cocoon low down towards the roots of the grass, just at the period when it is most rapidly growing—you should begin mowing two days before *ianira* emerges—hence it must be very liable to injury and pressure by stems of plants rapidly growing, or, more probably, bent down by wind or other accident. I suppose it is agreed that these bleachings are pathological, and probably due to pupal injury. This note is to suggest the nature of the injury.—T. A. Chapman; Firbank, Hereford.

A New Local Entomological Society.—A number of entomologists met at the house of Mr. Eales on November 30th, and formed a Society called "The Carlisle Entomological Society." Twelve members were enrolled, officers were chosen, and a number of rules were made. Mr. Christopher Eales was elected President; and Mr. John Buckle, Secretary and Treasurer. The meetings are being held at the house of Mr. Eales for the present. We will forward the reports of the meetings each month.—John Buckle, *Secretary*. [We have very great pleasure in publishing the above announcement, and wish the newly-formed Society every success.—Ed.]

Proposed List of Entomological Societies, &c., in Great Britain. —We believe that the time has arrived when a list of Entomological Societies, and of Natural History Societies and Field Clubs, of whose members a greater or lesser number are interested in Entomology, would be both interesting and valuable. We therefore ask Secretaries of all such associations to be good enough to forward us particulars of their respective Societies or Clubs. Information under the following heads is all that is really necessary, but any other items of general interest might be added: — 1. Name. 2. (*a*) Date of meetings; (*b*) where held. 3. Date of foundation. 4. Number of members. 5. Annual subscription. 6. Officers and Council for 1894.

The Burney Collection (Heterocera).—Particulars of the prices realised for the butterflies were given in a former note (Entom. xxvi. 359); the present account deals with the Sphinges and Bombyces. Two examples of *Sphinx pinastri* and seven of *Acherontia atropos* sold for 24/–; whilst one specimen of the former and six of the latter, comprising another lot, realised 22/–. There were ten specimens of *Chærocampa celerio*, and seven of these were disposed of at about 10/– each; one, with two examples of *Deilephila galii*, for 24/–; another, also with two *D. galii*, for 22/–; and one, with three *D. galii*, for 30/–. Two of the original specimens of *D. euphorbiæ*, bred by Mr. Raddon from Devonshire larvæ, commanded £6 6s. and £6 16s. 6d. each; whilst a third example, "taken in the Isle of Man by Chas. S. Dewhirst, July 15th, 1868, teste G. B. Hodgkinson," only brought in £3 13s. 6d. Six *D. galii* produced 32/6. Of the eleven specimens of *D. livornica* (*lineata*), one was knocked down for 26/–, and another for 35/–; two were sold for 30/–, and the other seven hardly averaged 8/– each. Two lots of *Sesia*, each including one example of *andreniformis* and two of *scoliiformis*, went for 32/6 a lot; two other lots of *Sesia*, comprising among other species *scoliiformis* (4), each fetched 20/–. Four *S. sphegiformis* and two *S. asiliformis* were sold for 42/–, and a similar lot for 35/–; whilst three *S. sphegiformis* and one *S. asiliformis*, ex. coll. Standish, fetched two guineas. *Zygæna exulans* and *Z. nubi-*

gena produced about 6d. apiece. There were three lots of *Lithosia caniola* and *L. molybdeola* (*sericea*), six examples of one and five of the other, with a few *deplana*, &c., in each lot; these realised 35/- 26/- and 22/-. *Deiopeia pulchella*, of which there were ten specimens, were disposed of in couples at from 20/- to 32/6. Two examples of *Callimorpha hera*, "taken in 1884 by Brook and Waring at Star Cross, Devon," made 35/-; and a black variety of *C. dominula* sold for £10. A specimen of *Nemeophila plantaginis* var. *hospita*, together with a variety with almost obsolete markings, fetched 35/-. Varieties of *Arctia caia* were not either numerous or very remarkable, but a very pale specimen found a purchaser at 35/-; and another pale example, lotted with a dark one, made two guineas. The old fen form of *Ocneria dispar* ran up the price of the respective lots, in which two female examples were included, to 25/- and 35/-. *Lælia cænosa* were sold in pairs at 25/- 20/- 22/- 26/- and 26/-, and two very nice males also went at last quotation. *Lasiocampa ilicifolia* (12 specimens) made from 15/6 to 18/- each. *Drepana harpagula* (=*sicula*), of which there was a series of seventeen specimens, were mostly sold three in a lot, and realised prices which gave an average of 6/- per specimen. *Dicranura bicuspis* (15 examples) sold at 20/- to 24/- per pair, and males at 14/- to 18/- per brace; but the two examples of *Glyphisia crenata* only brought in 8/- and 15/-. The five specimens of *Notodonta bicolor* offered were disposed of at one guinea to £2 5s., males, and a female realised £2 10s. Three examples of *N. trilophus* (*tritophus*), offered singly, were sold at 24/- 30/- and 12/- each, and a fourth specimen, included in a lot with *N. dictæa*, *dictæoides*, &c., fetched 14/-. —Richard South; 12, Abbey Gardens, St. John's Wood, N.W.

The late Rev. H. Burney's Collection.—I may mention that the two specimens of *Luperina gueneéi* in this collection were from me. Three specimens of this insect were captured on the same day, and the third example was sent by me to Miss C. Sulivan, of Fulham. A fourth specimen, which I possess, was formerly in the collection of the late J. F. Brockholes, and no doubt he took it very near the place where the others were found. I was surprised to find that *Heliothis scutosa* was not down in the catalogue of this sale. Mr. Burney had an example of the species from me, and this specimen was well known to many, and was described and commented on by my esteemed friend Mr. C. G. Barrett (Ent. Mo. Mag. xiv. 67). I may add that if I can give particulars of any of the other rarities that were in this collection I shall be very pleased to do so.—J. B. Hodgkinson; Preston, December 14th, 1893.

More greasy Moths wanted.—As there are still some points in connection with this subject which I am anxious to clear up, I shall feel greatly obliged to anyone who will kindly furnish me with more greasy moths, especially goat-moths or hawks of this season's breeding or capturing.—H. G. Knaggs; Camden Villa, Lennard Road, Folkestone.

Errata.—Entom. xxvi. p. 349, line 8 from top, for "enlared" read "enlarged"; p. 355, line 9 of note on *Zygæna meliloti?* for "country" read "county"; p. 356, line 23 from bottom, for "The male is figured" read "This mark is figured."

CAPTURES AND FIELD REPORTS.

Insects at Light during 1893.—During the past year I have been working light pretty systematically, and the results may be of interest to entomologists in general. It was not until the end of June that I looked for insects at electric light. There are only two large globes here, which are situated about forty yards apart, and are almost in the centre of the town. Having, however, commenced to work electric light, I included these in my nightly rounds, giving them particular attention, and staying sometimes as late (?) as half-past one or two o'clock in the morning. From eleven to twelve seemed about the most profitable hour. My reward was the capture of the following in more or less abundance, and in more or less bad condition, between June 30th and October 30th :—*Smerinthus populi* (3), *Sphinx ligustri* (saw 1), *Nola cucullatella* (2), *Lithosia lurideola* (1), *Arctia caia*, *Porthesia similis*, *Orgyia antiqua*, *Trichiura cratægi* (1), *Bombyx neustria* (several), *Uropteryx sambucaria* (common), *Rumia luteolata*, *Selenia bilunaria* (*juliaria*), *Eugonia alniaria* (common), *E. fuscantaria*, *Himera pennaria*, *Amphidasys betularia*, *Boarmia gemmaria*, *Acidalia virgularia*, *A. aversata* (common), *Halia vauaria*, *Abraxas grossulariata*, *Larentia didymata*, *Eupithecia succenturiata*, *E. rectangulata*, *Hypsipetes sordidata*, *Melanippe fluctuata*, *Camptogramma fluviata* (1), *Cidaria associata*, *Cilix glaucata* (several), *Phalera bucephala*, *Lophopteryx camelina*, *Notodonta dictæa*, *Bryophila perla* (common), *Acronycta tridens*, *Leucania conigera*, *L. lithargyria*, *L. pallens*, *Nonagria lutosa* (fairly common), *Gortyna ochracea* (1), *Hydrœcia micacea*, *Axylia putris*, *Xylophasia monoglypha* (common), *Neuronia popularis* (3), *Luperina testacea* (very common), *Mamestra persicariæ* (excessively abundant in July), *Apamea didyma*, *Miana bicoloria*, *Caradrina alsines*, *C. taraxaci*, *C. quadripunctata*, *Agrotis puta* (2), *A. segetum*, *A. nigricans*, *A. tritici*, *A. aquilina*, *Noctua augur* (common), *N. plecta*, *N. c-nigrum* (any number), *N. xanthographa*, *Triphæna comes*, *Mania typica*, *Anchocelis pistacina*, *Xanthia gilvago*, *X. flavago*, *Calymnia affinis*, *Hecatera serena*, *Folia flavocincta*, *Cleoceris viminalis* (?), *Phlogophora meticulosa*, *Hadena trifolii*, *H. oleracea*, *Plusia chrysitis*, *P. iota*, *P. pulchrina* (1), *P. gamma*.

Besides the above, I have taken, mostly flying towards the light:—Coleoptera: *Pterostichus nigrita*, *Amara tibialis*, *Creophilus maxillosus* (several), *Aphodius rufipes* (comnon). Hymenoptera: *Formica rufa* (several), *Aphion luteus* (common).

In my diary I find the following note under September 7th :—"*Noctua c-nigrum* is now going off. It has been a perfect pest, often four or five, sometimes more, round the light at a time. After a little practice, however, one can distinguish them by their flight, and, when caught, by the habit they have of *running* very fast up the net. They settle anywhere on the lamp, near the lamp, and on the ground, windows, or masonry." I would be much obliged and interested if lepidopterists in other parts of the country would inform me whether their notes as regard this moth are identical with my own. All local collectors have had the same experience. *Noctua c-nigrum* has by no means been confined to electric light, having been taken at street-lamps, sugar, ivy, honeydew, among low plants, and, indeed, by every conceivable method, and in every possible situation, by which and in which moths are taken. The first specimen emerged from pupa on the 15th of May, and the insect continued to be present with hardly a break until the 9th of October, when I took my last specimen at electric light. There appear to be two varieties (?) of this moth; the ground colour in one is almost, and in dark specimens quite, black; the other, which I take to be the type, has invariably a brown tinge throughout. Whether this variation is merely sexual distinction or not I have not had the opportunity of ascertaining.

I have also taken the following Lepidoptera at lamps, both street and indoor, during the past season:—*Nola cucullatella*, *Spilosoma lubricipeda* and *S. menthastri* (common), *Porthesia chrysorrhœa*, *P. similis*, *Leucomia salicis*, *Orgyia antiqua*, *Bombyx neustria*, *Lasiocampa quercifolia* (1), *Rumia luteolata*, *Selenia bilunaria*, *Himera pennaria*, *Biston hirtarta* (a few), *Amphidasys strataria*, *A. betularia*, *Hemerophila abruptaria*, *Boarmia gemmaria*, *Hemithea strigata* (1), *Acidalia virgularia* (common), *A. aversata* (common), *Halia vauaria*, *Hybernia rupicapraria* (common), *H. marginaria*, *Anisopteryx ascularia* (common), *Cheimatobia brumata* (Oct. 24th), *Oporabia dilutata*, *Eupithecia succenturiata*, *E. innotata ? E. subnotata ? E. vulgata*, *E. absinthiata*, *E. rectangulata*, *Melanippe fluctuata* (very common), *Anticlea badiata*, *A. nigrofasciaria*, *Coremia ferrugata*, *C. unidentaria*, *Cidaria miata* (several), *C. immanata*, *C. dotata*, *Chesias spartiata* (several), *Drepana binaria*, *Cilix glaucata*, *Phalera bucephala*, *Notodonta dictæa*, *Asphalia ridens* (2), *Bryophila perla* (common), *Leucania conigera*, *L. pallens*, *Hydrœcia micacea*, *Neuronia popularis*, *Luperina testacea* (several), *Mamestra persicariæ*, *Miana strigilis*, *Caradrina morpheus*, *Agrotis suffusa*, *A. nigricans*, *Noctua augur*, *N. c-nigrum* (common), *N. xanthographa* (one of them I took at the oil-lamp on the Great Eastern, while the train was in motion, between Harwich and Manningtree), *Amphipyra tragopogonis* (several), *Tæniocampa gothica*, *T. incerta*, *T. stabilis*, *Orthosia lota*, *Anchocelis pistacina*, *Scopelosoma satellitia*, *Xanthia flavago*, *X. gilvago*, *X. circellaris*, *Phlogophora meticulosa*, *Euplexia lucipara*, *Hadena oleracea*, *Gonoptera libatrix*, and *Plusia gamma*. Coleoptera; *Serica brunnea* (several), *Aphodius fœtens* and *A. rufipes* (common). Hymenoptera: *Ophion lutens ?* (in plenty).

The prevalence of *Agrotis puta* this year is very remarkable. My friend Rev. J. H. Hocking says, with Mr. Newman, that he has taken it commonly "in his garden," at Copdock, about four miles out; and I myself have taken it both at electric light and ivy in September.—CLAUDE MORLEY; High Street, Ipswich, November 3rd, 1893.

COLLECTING IN SURREY.—This year has, as far as my experience goes, been a very marked contrast as compared with last, save, perhaps, the "sallow blooming," which with me was particularly favourable. On March 5th I noticed that the sallows were already out, and promising well for a good "draw." Next evening I started out, with sheet and pill-boxes, to the attractive tree. As I anticipated, moths were there right enough, and plenty of them. *Tæniocampa instabilis*, *T. cruda*, *T. gracilis*, and of course *T. gothica*, all showed up well; I also descried a few *Scopelosoma satellitia*, and some very dark *Cerastis spadicea*. On the 7th the results were similar, but with the addition of *T. populeti*, a species new to me, All through the week I had very favourable nights, and secured three more *T. populeti*, all of which were in very fine condition. The total number of species I noticed at sallows was eleven, which comprised, in addition to those enumerated above, *T. munda* (which is, as a rule, rare in this neighbourhood), *Anisopteryx ascularia*, and *Pachnobia rubricosa*. Some of the latter were very beautiful and of a very fine deep red colour. In the meantime, imagos from pupæ of *Saturnia carpini* (= *pavonia*), received in the autumn from the North, were emerging daily; but they were not nearly so fine as I have had them; one specimen is much darker in ground colour than usual. The early Rhopalocera I have already referred to (Entom. xxvi. 199). May 11th being a beautiful bright day, I started off to my favourite hunting-ground at Oxshott, in search of *Nemeobius lucina*. After a couple of hours' searching, I managed to find the "colony" in one of the remotest corners of the wood, called "The Prince's Covers." I was unable then to take more than a couple of specimens, as I had already filled my boxes with other species, the best of which were two *Drepana hamula* and one *Macroglossa bombyliformis*. Eventually I completed my series of *N. lucina*. Amongst other insects that I have taken this year at Oxshott are—*Macaria liturata* and *Bupalus piniaria* in profusion, *Geometra papilionaria*, *Drepana falcula*, *Bapta temerata* and *B. taminata*, both of which are, however, to be found more commonly in Ashtead woods, some five miles distant; *Lycæna ægon*, and *Ellopia fasciaria*. Of insects taken more in my own immediate neighbourhood, I may mention that formidable insect (in the larva state) *Cossus ligniperda*. Out of one tree I took no fewer than thirty healthy larvæ, and have repeatedly taken one or two out of various other trees. *Pericallia syringaria* occurs here every year, though sparingly. The same remark also applies to *Pterostoma palpina*, which comes to light in June. I was much pleased on turning up *Phorodesma bajularia* this summer; I should have thought this a most unlikely insect to occur here, as there are very few oaks indeed about this place, the predominating tree being the elm (*Ulmus campestris*).—A. J. Kaye; Worcester Court, Worcester Park, Surrey, October 20th, 1893.

Collecting at Wicken.—On July 15th to 24th, in company with Mr. H. Robson, I had the pleasure of re-visiting the Fen, and although the nights, on the whole, were very unfavourable for attraction by light, we managed to make acquaintance with a few of the Fen species. We had neither of us seen *Papilio machaon* at home, and were naturally anxious to obtain a series of this grand insect. Although plenty of specimens were seen, only a small proportion were captured, owing to the wind, and the majority of those secured were in poor condition. However, ova and young larvæ (mostly just hatched) were readily obtained, but those about full-fed were infrequently met with. For light we only had two good nights, one of which was spoilt by heavy rain. We were very much surprised that the lamp attracted so few Bombyces, for we expected that *Bombyx neustria* and *Odonestis potatoria* would be quite a nuisance. Sugaring in the lanes was fairly successful, but the flowers of the rush were decidedly more attractive. The following were among the species taken:—*Smerinthus populi*, *Bombyx neustria* (2), *Odonestis potatoria* (2), *Arctia caia*, *Spilosoma fuliginosa* (2), *Nudaria senex*, *Lithosia lurideola* (*complanula*), *L. griseola*, *L. stramineola* (1), *Epione apiciaria*, *Acidalia immutata*, *Cidaria testata*, *Pelurga comitata*, *Hypsipetes sordidata* (*elutata*), *Simyra venosa*, *Leucania impura*, *L. impudens* (*pudorina*), *Calamia phragmitidis*, *Apamea leucostigma* (*fibrosa*), *Cosmia affinis* (2), *Amphipyra tragopogonis*. With the exception of *Papilo machaon*, larvæ were not at all plentiful, and were hard to find. By searching, a few were obtained of the following species:—*Smerinthus ocellatus*, *Chærocampa elpenor*, *Macroglossa stellatarum*, *Saturnia pavonia* (*carpini*), *Dicranura vinula*, *Bombyx rubi*, and *Simyra venosa*. A journey to Tuddenham was a failure entomologically—only a few larvæ in pods of *Silene inflata* (I hope some may turn out *Dianthœcia irregularis*), and two imagines of *Acidalia rubricata*. I hear on good authority that the draining of Wicken Fen is again in contemplation. If such should be the case, I hope the Entomological Society, in conjunction with other societies interested in Natural History generally, will be in a position to save this famous locality from sharing the fate of its neighbour (Burwell). The area of the Fen is at present a very limited one, and should its most interesting fauna and flora become a thing of the past. I am sure it would be deplored by all those who can appreciate and see beauty in this home of *Papilio machaon*.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W., October 4th, 1893.

COLLECTING AT DAWLISH.—As I recently spent a fortnight's holiday with my friend Mr. C. Nicholson at Dawlish, a few notes on the collecting at that place may be acceptable. We left London on the 18th of September, returning on the 5th of October. We found excellent accommodation at Mrs. Hannaford's, a large grocer's shop on "The Lawn," where we were boarded and lodged very cheaply indeed. We found *Colias edusa* common, particularly on the railway banks, and in one large waste field overgrown with thistles and hawkweed, at Luscombe. In this field there was also a perfect colony of *Vanessa atalanta*; I have never before seen this insect so plentiful in one spot; they settled on the thistle-heads, flew up, one might almost say, in shoals, at your approach; we saw three specimens which had the red band on the hind wing slightly bleached, but Mr. Nicholson only succeeded in capturing one of them. An occasional *V. urticæ*, *V. io* and *V. cardui* also turned up, and a few specimens of *Pararge egeria* and *P. megæra*; the latter insect appeared to come out during our visit, for it was certainly much commoner when we left Dawlish than when we arrived there; no females were taken during the first few days of our stay, after which their number gradually increased. There were some lovely forms of *Plusia gamma* about, some of which we could not help taking for their very beauty. *Polyommatus phlœas* was also common, the condition varying from "just out" to the "very ancient." Larva-beating proved a failure, hardly a larva of any consequence being taken. The woods at Dawlish, I may say, look better from a distance, to the entomologist's eye, than on a closer inspection; they seem to be principally used as game-preserves; oak is comparatively scarce, the commonest trees being ash and edible chestnut. Sugaring was also a failure; the first night we obtained one *Hadena protea* and an antiquated *Phlogophora meticulosa*; the second night we obtained one *Anchocelis pistacina*, and a specimen of *Triphæna pronuba*, apparently saved from the flood; the third night we obtained nothing whatever; then we gave it up in disgust. A much greater success was the ivy, which abounds at and around Dawlish; but, of course, we did not find the best of it until a night or two before we left; however, our last four nights were fairly successful. On Sept. 30th we took *Orthosia macilenta*, *Xanthia ferruginea*, *Anchocelis pistacina*, a splendid specimen of *Xylophasia polyodon*, *Cerastis vaccinii*, *Hadena protea*, *Agrotis segetum*, and *P. gamma*; we also took one specimen of *Cerastis spadicea* (*ligula*), and a pair of *Epunda lichenea*: I suppose these *lichenea* were the best insects we got during our visit; unfortunately they are not in very brilliant condition. On Oct. 2nd we took, besides the common things mentioned above, three more male *E. lichenea*, one specimen of *Orthosia lota*, and one of *Agrotis saucia*. On Oct. 3rd we took another *A. saucia*, several *P. meticulosa*, some more *E.*

lichenea, one *Cidaria psittacata*, one *Anchocelis rufina*, one *Agrotis puta*, and two worn *Triphæna comes.* On Oct. 4th we got another *C. psittacata*, more *E. lichenea*, a few more *C. spadicea*, several *Anchocelis lunosa*, one *Scopelosoma satellitia*. and one *Agrotis suffusa.* The condition of the "ivy" things was, as a general rule, first-rate; the majority of them appeared to be only just coming out.—LAWRENCE J. TREMAYNE; 4, Lanark Villas, Maida Vale, W., November 4th, 1893.

COLLECTING AT MARKET DRAYTON.—It has been a wonderful season here for moths; especially I have noticed the large numbers of species usually common, which this year have been abundant, e.g., *Lobophora lobulata*, *Hadena adusta Rusina tenebrosa*, in the spring; and in the late summer, *Noctua c-nigrum*, *Xanthia silago*, *X. cerago*, and *X. ferruginea*, *Noctua glareosa*, *Agriopis aprilina*, *Miselia oxyacanthæ* var. *capucina.* Sugaring was good in May, when *H. adusta*, *H. thalassina*, *Euplexia lucipara*, and *Rusina tenebrosa* swarmed at it; but almost useless in June, July, August, and the first part of September. I too found here, as Mr. Day did at Knutsford, that the moths swarmed on the flowers of a tallish grass, which grows in the mosses and damp places in woods. In one evening I found numbers of *Xanthia silago*, *X. cerago*, *Phlogophora meticulosa*, and *Noctua c-nigrum*, and a few *N. umbrosa*, *Hydræcia micacea*, *Tapinostola fulva* and *Celæna haworthii.* This was in the first week of September. In the middle of September I took two very fine specimens of *Vanessa c-album* in my garden, and on the 9th of October another specimen a little worn; I have never seen it here before. *V. atalanta* has been most abundant all through August and September; *V. urticæ* and *V. io* very scarce. *Pieris brassicæ* unusually common. It is by no means common here as a rule.—F. C. WOODFORDE; Market Drayton, Salop, October 25th, 1893.

COLLECTING AT TONBRIDGE WELLS AND ASHDOWN FOREST.—The past season, has, I consider, been a bad one for collecting. Larvæ in the spring were unusually abundant. At lamps and sallows I took *Cymatophora flavicornis*, *Anisopteryx æscularia*, *Hybernia aurantiaria*, *H. progemmaria*, *Selenia illunaria*, *Tæniocampa gothica*, *T. stabilis*, *T. instabilis*, *T. rubricosa.* All insects here and on the Forest were quite three weeks earlier. Sugar has not been profitable. At light I took *Bombyx rubi*, *Habrostola urticæ*, *Hypsipetes ruberata*, *H. elutata*, *Heliophobus popularis*, *Iodis lactearia*, *Panagra petraria*, *Melanippe montanata*, *Melanthia albicillata*, *M. ocellata*, *Cabera exanthemaria*, *Larentia didymata*, *Lomaspilis marginata*, *Euthemonia russula*, *Metrocampa margaritaria*, *Plusia moneta* (1), *Cidaria dotata*, *Geometra papilionaria*, *Odontopera bidentata*, *Pseudoterpna cytisaria*, *Halia wavaria*, *Hemerophila abruptaria*, *Boarmia consortaria*, *Timandra amataria*, *Oporabia dilutata.* At sugar I took, among others, *Hadena adusta*, *H. proteus*, *H. thalassina*, *H. oleracea*, *H. pisi*, *Thyatira batis*, *Acronycta psi*, *A. rumicis*, *Dipterygia pinastri*, *Noctua c-nigrum*, *N. brunnea*, *N. baja*, *N. triangulum*, *N. festiva*, *Miana strigilis*, *M. literosa*, *Plusia gamma*, *P. iota*, *P. pulchrina*, *P. chrysitis*, *Caradrina cubicularis*, *C. morpheus*, *Gonophora derasa*, *Euplexia lucipara*, *Leucania pallens*, *L. impura*, *Lopharia* [*Xylophasia*] *lithoxylea*, *L. polyodon*, *Triphæna fimbria* (4), *Amphipyra pyramidea*, *Agrotis agathina*, *A. suffusa*, *A. segetum*, *Anchocelis litura*, *A. lunosa*, *A. rufina*, *Orthosia lota*, *Cerastis vaccinii*, *Xanthia silago*, *X. cerago*, *X. ferruginea*, *Scopelosoma satellitia.* The hornets coming to sugar on some nights were a great nuisance, especially as they carried away insects.—R. A. Dallas Beeching; 24, St. James's Road, Tunbridge Wells, November 13th, 1893.

Notes from Norwich.—A specimen of *Dianthœcia cucubali* was taken here on Oct. 11th. Newman gives June for its appearance. Among our captures of the past season we note the following:—Male and female *Platypteryx hamula*, one *Triphæna interjecta*, one *Melanthia albicillata*, two *Corycia taminata*, and several specimens of *Boarmia abietaria*. *Sesia apiformis* being common here, we shall be pleased to supply any readers of the 'Entomologist' with one or two cocoons of this formidable-looking moth.—B. C. Tillett; Sprowston Lodge, Norwich, November 27th, 1893.

Captures in October and November, 1893.—During October, and so late as Nov. 11th, specimens of *Xylophasia monoglypha* (*polyodon*) came to ivy-bloom and sugar; the examples were rather smaller in size than those usually seen in the summer. A few specimens of *Agrotis exclamationis* also appeared in October. *Xanthia circellaris* (*ferruginea*), *Cerastis spadicea*, and *S. satellitia* have been abundant on mild evenings throughout November. On Oct. 20th I noticed a solitary specimen of *Caradrina cubicularis* at ivy-bloom. On Oct. 19th I saw the only specimen this season of *Vanessa cardui*.—T. B. Jefferys; Langharne, Carmarthenshire, December 6th, 1893.

Notes from Gloucestershire.—I saw *Vanessa atalanta* the first week in April, and have seen it without a break of more than a week's duration, until the last week. *Macroglossa stellatarum* has been more plentiful during the past summer than I have seen it for thirty years. *Chrysophanus* (*Polyommatus*) *phlœas*, abundant here as elsewhere; the last specimen, apparently freshly emerged, observed on November 1st.—N. F. Searancke; Micheldean, Gloucester, November 7th, 1893.

Aleurodes brassicæ.—This little insect, referred to by Mr. C. W. Dale (Entom. xxvi. 357), has been over-abundant in many gardens in this locality, the brussels sprouts having been much affected with them.—T. B. Jefferys, Langharne.

Rare British Dragonflies.—During the past reason I have added to my collection a specimen each of two very rare species of dragonflies, namely, *Æschna rufescens*, from the Fens, and *Æ. mixta* from the metropolitan district.—W. Harcourt Bath.

Hornets in Worcestershire.—Hornets have appeared this season in a certain district in Worcestershire in unusual numbers, though for several years past they have been on the decrease.—W. Harcourt Bath.

Abundance of Wasps.—Wasps have swarmed in countless numbers during the past season, in every locality visited by myself in S. Britain. In some districts they did a great deal of damage to the fruit crops. The dry weather experienced in the spring is no doubt at the bottom of it all.—W. Harcourt Bath.

Decticus verrucivorus.—A few months ago I appealed (Entom. xxvi. 164) for information concerning the capture of any specimen of this rare and handsome grasshopper in this country within the last few years. As I did not get any response to my enquiry, I presume very few specimens have been obtained It may therefore be as well to place on record the capture of two examples which I possess in my collection, namely, a green female, at Deal in 1889, and a brown variety of the same sex from the New Forest in Sept. 1891. The latter is the variety *binglei* of Curtis. I am only aware of one other record during the same period, namely, of the capture of a specimen in Kent.—W. Harcourt Bath.

Colias edusa, C. hyale, &c., in Bedfordshire.—*C. edusa* appeared in fair numbers here this season; I took three or four specimens, males, in fair condition, and saw others. On July 25th, 1892, I captured a fine specimen of *C. hyale*, yellow variety, evidently just emerged. *Macroglossa stellatarum* has been plentiful this year, and the total absence of *Vanessa cardui* is most noticeable.—Alfred H. Blake; High Street, Biggleswade, Beds, November 23rd, 1893.

Reported occurrence of Colias hyale in Dorsetshire in 1893.—After reading the note by Mr. F. W. Freir (Entom. xxvi. 322), in which he mentions that he saw, but failed to capture, a specimen of *Colias hyale* at Swanage in August last, I wrote to inform him that this species so rarely visits Dorsetshire that unless he had a sufficiently close view of it at rest to enable him to make sure about the identity of the insect, I had little doubt but that it was only *C. edusa* var. *helice*. In his answer Mr. Freir told me that, after thinking over the matter, he had come to the conclusion that my suggestion as to the butterfly being var. *helice* was in all probability correct, and left me at liberty to publish a note cancelling his former statement (*l. c.*). So very few examples of *C. hyale* have ever been taken in Dorset that, unless the pale "clouded yellows" that are seen here can be secured, or at any rate identified for certain, the only wise course is to take for granted that they are var. *helice*, for the *onus probandi* clearly rests on those who claim to have met with *C. hyale* in this county. So far as I am aware, not a single specimen of the latter was observed in Dorset in 1892, although it then occurred, but very rarely, near Bournemouth, in Hants; that was presumably the most westerly point that it reached on the south coast, for I have not noticed any record of its appearance in either Devon or Cornwall during that year.—Eustace E. Bankes; The Rectory, Corfe Castle, Dorset, December 19th, 1893.

[We shall feel greatly obliged to correspondents if they will abstain from recording species of whose identity they are not absolutely certain.—Ed.].

Aplecta advena in Ireland.—I caught three specimens of *Aplecta advena* here last season. I believe it is the first time this species has been captured, or at all events noted, in Ireland.—W. B. Thornhill; Castle Cosey, Castle Bellingham, Ireland, December 18th, 1893.

Epione vespertaria in Hereford.—In the List of Lepidoptera taken last year at or near Hereford (Entom. xxvi. pp, 277, 278), for *Epione vespertaria* read *E. advenaria*.

Reports of Societies.—Although our present number extends to thirty-two pages, publication of the Proceedings of Entomological Societies is unavoidably postponed until February, when a double number will be issued.

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ON AN UNUSUAL NUMBER OF MONSTROSITIES OCCURRING IN *EROS (PLATYCIS) MINUTUS*, F.

By John W. Shipp.

Mr. Rye (Ent. Mo. Mag. xii. p. 107, 1875) gave a few instances of examples of monstrosities occurring in a series of *Eros (Platycis) minutus*, which were taken in Leigh Woods, near Bristol. Having had the good fortune to find a colony of the species in Splatts Wood, Gloucestershire (Ent. Mo. Mag. xxviii. p. 288, 1892), I was this year (1893) delighted to find that the colony still existed. I, however, found that a large proportion of the species were deformed in many parts, notably in the antennæ and elytra. This colony exists in an old rotten ash-stump, which is infested with *Sinodendron cylindricum*, and upon the frass of which the insects probably exist. Mr. Rye also found his insects upon an old stump, which he supposed was oak, although it may in all probability have been ash. I found the imagines embedded in the powdery frass at the entrance to the burrows, or crawling about in a very sluggish manner around the foot of the stump; but a careful and prolonged search failed to discover any traces of either larvæ or pupæ. However, traces of the perfect insect were to be found in the frass and burrows in the stump, as an occasional elytron, or head and broken antenna, testified; but the strictest search failed to elicit more. Some of the fragments were found at some distance in the interior.

Mr. Rye took forty-seven specimens, of which only seven were females. This is remarkable, for out of a total of thirty-three specimens taken in 1892, the proportion of females were as three to two, whilst in August, 1893, out of a total of thirty-five specimens, twenty were females; thus showing that the females exceed the males. The insects themselves are of a very sluggish disposition, rarely moving more than a few inches during the heat of the day, and, although I watched them for hours, I did not see any disposition to use their wings, although Mr. Rye states that one specimen flew briskly. They are to be found in the chinks of the rotten wood, or else resting on a piece of rotten wood or fragment of stick; the damper the situation the more they appear to enjoy it. On being touched or disturbed they feign death, but as soon as all is quiet again they make off to the friendly shelter of a lump of wood, or whatever happens to be in their way, where they remain quiescent until again disturbed.

I was surprised to notice, however, that only the perfect males and perfect females were *in cop.*, but on one occasion only did I see a perfect male and a slightly distorted female together.

Out of the thirty-five examples captured in 1893, eleven of them have either one or both of the antennæ deformed. Three of them have the joints 8 and 9 anastomosed, while in another specimen the joints 9 and 10 are coalescent, and in another it is joints 10 and 11. In five of the remaining cases the antennæ are imperfectly developed, probably owing to injury in the pupal stages; in one specimen the 4th and 5th joints on each side are doubled over, as if they had been forced into each other, the middle of each joint being notched. In all the cases the antennæ are twisted out of shape. The 5th joint, in the last case, of the left antenna is unduly dilated on the outer side.

In only one case is the thorax distorted, and then it is almost circular in shape, both the anterior and posterior angles having disappeared; the transverse carinæ have also disappeared, leaving the thorax quite smooth.

In seven cases the elytra are deformed; two specimens have the left elytron much shorter than the right, but this is a common occurrence in all beetles. In the remaining five cases the elytra were most probably retarded in development, being twisted into a variety of forms.

A great number of the specimens taken have the striæ of the elytra anastomosed. One specimen has the left intermediate tibia shortly twisted, while the corresponding tibia on the right is abnormally curved. Four specimens have the hind tarsi abnormal. No specimens with superfluous limbs or joints were seen.

In my notes of my captures in 1892, I find that out of thirty-three specimens, eight had abnormal antennæ, five had abnormal elytra, and seven had abnormal legs. Mr. Rye states that he found one specimen which had a male antenna on the right and a female antenna on the left. Another specimen, a male, had the right front tibiæ deeply bifurcate at the apex, the upper furcation bearing a normal tarsus, and the lower bearing a tarsus of which the three basal joints were normal, the fourth unduly dilated, with two perfectly formed claw-joints springing from near the centre of its apparently monstrous lobes.

It is remarkable that such an extraordinary amount of monstrosity and deformity should exist in this interesting species. Certainly it is a fragile insect, but others, as *Telephorus*, *Malachius*, *Lampyris*, although as lightly formed as *Platycis*, are not so prone to distortion.

Oxford University Museum, December, 1893.

RHOPALOCERA FROM THE ALPES-MARITIMES IN 1893.

By Frank Bromilow, F.E.S.

(Concluded from vol. xxvi. p. 349.)

Vanessa c-album, L. It has not been very common this year; I saw an example at Caussols, on September 29th, settled on a maple tree in front of our house. *V. egea*, Cr. Seen for the first time, this year, on May 29th, at Vence, settled on a wall; I took nine examples near the same place, later; also at Carabacel and the Vallon des Fleurs at Nice; in the Alpes-Maritimes it almost seems to replace *c-album*. It is stated by Millière that there are three broods in the course of the year. *Egea's* habit of settling on walls and palings is noticeable, and it sometimes frequents gardens. Ab. *j-album*, Esp. Occurs with the type, but is rarer, being most generally met with in the autumn; first noticed on an excursion to the "gorges du Loup" (department of Var), on March 11th; a female was taken for the last time, near our house at Nice, on October 27th. *V. urticæ*, L. Common; the first example was, I believe, seen near Nice, on February 16th. *V. io*, L. Always abundant; rare in mountain districts; first observed on March 17th, at St. Maurice, north of the town of Nice. *V. antiopa*, L. Common on the coast; scarce at about 4000 feet altitude. *V. atalanta*, L. Very common; I have seen it at a height of 3960 feet above sea-level, but it does not ascend to any great elevation in the mountains. *V. cardui*, L. Abundant, but less so than the last; in former seasons I have observed it at an altitude of 8774 feet, on Mont Pepiori, in the northern extremity of the Alpes-Maritimes.

Melitæa cinxia, L. Common; also in the mountainous parts. *M. aurinia* v. *iberica*, Oberth. Several specimens were seen for the first time this year at Vence, on May 29th. *M. didyma*, O. Abundant, and very variable in coloration; first taken in Nice, on June 27th. *M. athalia*, Rott. Generally distributed. This insect is also subject to variation; several years ago I took a form in which the two central rows of black spots on the fore wings coalesced, forming a band. Dr. Staudinger, to whom I sent it, stated it to be an "accidental aberration." *M. parthenie*, Hbst. One specimen only was, I believe, taken by our party at Caussols, on August 28th, but I have found it common in less bleak localities in other seasons.

Argynnis euphrosyne, L. Nice, in the Vallon des Fleurs; it was also captured at nearly 4000 feet elevation. *A. dia*, L. Common at Nice, in the Vallon des Fleurs, and many other places; this species I took at a height of nearly 4000 feet. *A. lathonia*, L. Abundant, perhaps the commonest of the genus; a specimen, which had probably hybernated, was seen for the first time this year at Cimiez (Nice), on March 17th; I noticed *lathonia* on the wing in the mountains, on October 2nd. *A. aglaia*, L. Common, up to about 6000 feet. The alpine specimens from an elevation of 5–6000 feet are often small and dusky.

Melitæa galatea v. *procida*, Hbst. Common; I saw the species flying, up to nearly 4000 feet. *M. syllius*, Hbst. A male specimen was taken, for the first time this year, in the Vallon des Fleurs, by my cousin E. C. Casey, as early as April 26th; common by the sea, on the Route de Villefranche, St. Jean, and many other places, on rocky ground, which renders it difficult to capture; we took it in profusion and in good condition on the Chemin de Villefranche, on May 2nd.

Erebia neoridas, B, Extremely common in certain localities, as at Thorenc and near Caussols.

Satyrus hermione, L. Common nearly everywhere, generally settling on trees. *S. alcyone*, Schiff. Somewhat rarer than the last. *S. circe*, F. Not uncommon; also in the mountains. *S. briseis*, L. Abundant on bare, stony ground, and by roadsides; I saw a worn male at Nice, on October 13th; common also in the mountains; it is difficult to take on account of its alertness. Ab. female *pirata*, Esp. I only took one specimen myself at Caussols, on August 21st, and another was, I think, observed. *S. semele*, L. Common on stony ground everywhere, but not at any very considerable elevation. *S. arethusa*, Esp. This butterfly, which Millière catalogues as local, occurred in numbers at Caussols, during July and August, on the stony ground. Var. *dentata*, Stgr., almost replaces the type in the Alpes-Maritimes; it frequented the same spots as the typical *arethusa*. I took a male, on August 19th, with the apical spot on the left front wing smaller than that on the corresponding wing. One example had as many as four spots on the fore wings; another had the red spots on all the wings smaller than in the average specimens, and the fore wings had one spot absent, which is present in most examples. I have also met with male individuals having *two* black spots on the fore wings, which number Dr. H. C. Lang, in his 'Butterflies of Europe,' says are confined to the females, the males only having *one*. I have also in my collection, from the same place, a worn female with five spots on the left fore wing, the dot nearest the apex being smaller than the others. Curiously enough, the right front wing had this small spot almost obsolete. Specimens, too, intermediate between type and variety, were of constant occurrence. First met with on July 30th. *S. statilinus*, Hufn. Abundant, flying also in the mountains. Var. *allionia*, F. Rarer than the last, but occurring in the same places as the type *statilinus*; I have taken it in former years in Nice, in the Val Obscur, at the end of July. *S. actæa*, Esp. Common at St. Vallier, Grasse, Caussols, St. Martin-Vésubie, and other localities; I took a male with two apical spots instead of one, and a female with two supernumerary spots not present in typical females. Var. *podarce*, O. I only took one specimen on the stony hill-side at Caussols, with examples of the type, on August 5th. Var. female *peas*, Hüb. One specimen was captured by myself in the last-mentioned locality, on August 11th.

Pararge mæra, L. Generally distributed in the alps. *P. megæra*, L. Common on the coast and in the mountains; many authors aver that the insect is on the wing throughout the year in the south, but Millière says that the last brood appears in October. *P. egeria*, Esp. Abundant nearly everywhere.

Epinephile lycaon, Rott. Common in the mountains. *E. janira*, L. Abundant in fields. Var. *hispulla*, Hüb. Common; examples transitional between type and variety are of frequent occurrence. *E. ida*, Esp. Fairly common on the coast; rare in the mountainous districts; the females appeared about a fortnight later than the males; the present year has been a great one for *ida*; first taken in Nice on June 29th; I captured a specimen in our garden, on July 21st, having the apical pupilled spot on one of the fore wings twice as small as that on the corresponding wing, similar to that already described in the case of *Satyrus arethusa* v. *dentata*. *E. tithonus*, L. Commoner than the last.

Cœnonympha dorus, Esp. Common on the rocky ground at St. Vallier; rare at Caussols; the first specimen was taken in the Val Obscur, Nice, on July 4th; the spots are very variable, both in size and number. *C. pamphilus*, L. Abundant everywhere.

Spilothyrus alceæ, Esp. Generally distributed; this insect was taken as late as October 21st, at Nice; ova and larvæ, some of the latter being full-fed, were found in large numbers on a mallow (probably *Malva ambigua*) in the mountains, at Caussols, on August 27th; during October I found larvæ, but sparingly, at Nice, in the rolled-up leaves of a mallow in our garden, and elsewhere. *S. altheæ*, Hüb. I have a specimen from the neighbourhood of Nice, taken some years ago, and submitted to Dr. Staudinger, who certified it to be a typical *altheæ;* scarcer than the last. The variety *bæticus*, Ram., of South-western Europe, I have not met with up to the present. *S. lavateræ*, Esp. Common on the coast and in the mountains, up to an elevation of about 3300 feet.

Syrichthus carthami, Hüb. Very common in the mountains up to 3960 feet altitude, at Caussols; I frequently met with it in little groups on damp ground near water; some of the females taken were deeply suffused with a powdering of greenish grey. *S. sao*, Hüb. Common everywhere; some examples are very small.

Nisoniades tages, L. I took a very unicolorous specimen, for the first time this year, at Nice, on July 4th.

Hesperia thaumas, Hufn. Abundant. *H. lineola*, O. Scarcer than the last. *H. actæon*, Esp. This year it was certainly the commonest "skipper" to be seen; first captured at Nice, on June 29th. *H. sylvanus*, Esp. Common in glades; captured, for the first time, in the Vallon des Fleurs, Nice, on July 1st. *H. comma*, L. Abundant.

(Erratum: Entom. xxvi., p. 358, line 18, for "3795 feet," &c., read "3960 feet," &c.)

Nice, France, November, 1893.

ON THE VERTICAL DISTRIBUTION OF THE BRITISH LEPIDOPTERA.

By W. Harcourt Bath.

(Concluded from p. 6.)

The following table shows the relative heights of each vertical zone in each of the various latitudes in the British Isles, with the chief elevated tracts contained in them, after allowing a license of half a degree of latitude each way. I have also shown what would be the mean annual temperature of each locality indicated, *at the sea-level,* deduced from the excellent charts published by the council of the Royal Meteorological Society (see 'The Meteorological Atlas of the British Isles,' 4to, 1883, price 5s., which I would recommend every intending student to obtain).

PROPOSED VERTICAL ZONES IN THE BRITISH ISLES.

Latitude.	LOCALITIES AND MOUNTAIN GROUPS.	Mean ann. temp. at the sea-level.*	South Coast zone. Mean ann. temp.† 53-50° F.	Lower Hill zone. Mean ann. temp. 50-45° F.	Upper Hill zone. Mean ann. temp. 45-41° F.	Low. Alpine zone. Mean ann. temp. 41-36° F.	Up. Alpine zone. Mean ann. temp.‡ 36-32° F.
	England & Wales.	F.	UP TO	UP TO	UP TO	UP TO	UP TO
50°	Scilly Isles	53°	900 ft.	......	......	......	......
	South Cornwall ...	52	600	2100ft.	......	......	......
51	South Coast	51	300	1800	3000ft.	......	......
52	South Midlands ...	50	......	1500	2700	4200ft.	......
	Brecknock Mts. ...						
53	North Midlands ...						
	Snowdonian Mts....						
54	Cumberland Mts....	49	......	1200	2400	3900	......
	Isle of Man						
55	Cheviot Hills	48	......	900	2100	3600	......
	Scotland.						
55	Lowlands	48	......	900	2100	3600	......
56	South Grampians ..	47	......	600	1800	3300	4500ft.
57	North Grampians ..						
58	Sutherland Mts. ...	46	......	300	1500	3000	4200
59	Orkney Isles.........						
60	Shetland Isles						
	Ireland.						
52	Kerry Mountains...	51	300	1800	3000	4500	......
53	Wicklow Mts.	50	......	1500	2700	4200	......
54	Mourne Mts..........	49	......	1200	2400	3900	......
55	Donegal Mts.						

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* The temperatures here given have been reckoned to the nearest degree.

† On the Continent this zone terminates equatorwards at the annual isotherm of 54·5, which is the northern limit of the olive or evergreen zone, constituting the typical arboreal conditions of the Mediterranean region.

‡ The summit of Ben Nevis represents a mean annual temperature of about 32·5, but it must be understood that the heights in feet given in the case of the higher zones, merely show the heights to which the belts in question would ascend if the elevations were of a sufficient altitude. In many cases, the highest mountains in each latitude only rise for a very little distance into the latter zones indicated.

The Grampian Mountains, in latitude 57° (which possess a mean annual temperature of 47° F. at the sea-level), may be taken as the standard for the British Isles, and in estimating their equivalent zones in other parts of the country an allowance of 300 feet for every degree of mean annual temperature has merely to be made, either added or deducted, as the case may be, whether it represents a higher or a lower figure respectively. This is founded on the well-known principle that for every 300 feet, or thereabouts, which one ascends up a mountain, the temperature falls about 1° F. The accompanying table will, I think, make this matter perfectly clear.

The best method undoubtedly for the entomologist to calculate the height of the various altitudes to which he ascends, is by means of an Aneroid barometer, which can be carried very easily, as it is only a small instrument. The cost of a good one, marked up to about eight or ten thousand feet, would be about £5. Other methods may be adopted, but this one is the best, I think, for our purpose. In recording observations upon the Lepidoptera occurring in each vertical belt or zone, the student should draw a distinction between those species which permanently reside within the limits of each and those which only visit them occasionally. A few examples will make this better understood.

Vanessa cardui has been seen upon the summit of Snowdon (3570 feet above the sea-level), while *Vanessa urticæ* and *Argynnis aglaia* have both been observed on the top of Cader Idris (2930 feet in altitude); but it stands to sense that none of them were bred at anywhere near to elevations named, as their pabula do not grow at anything like the height upon any mountains in this country. On the other hand, the following species possess such a weak power of flight that it would be quite safe to say that they had undergone their metamorphoses in the neighbourhood at which they were found. I allude to *Erebia epiphron* var. *cassiope*, which occurs on the mountains of Cumberland at the height of 1500 feet; *Erebia æthiops*, which is found in the region of the Grampians, from the sea-level to the height of 800 feet; and *Cœnonympha typhon*, which occurs in the same range, at no less an altitude than 2000 feet.

The student should also take special note of the number of broods found in each zone (those having two flights in the lower ones generally possessing only one at higher elevations); also of the varieties of each species in each zone of those which are common to two or more of them, many species in the higher zones developing either melanic or melanochroic tendencies when compared with their types in lower or more southern localities.

The study of the vertical distribution of the British Lepidoptera as here mapped out cannot, I think, fail to prove a new and very interesting source of pleasure to many an entomologist who wishes to direct his energies though some additional channel.

It will certainly have the result of stimulating mountaineering among those who, like myself, possess a special predilection for it, because, besides the object which most climbers have in view, namely, "a glorious glance around," it will in future, by those who take it up, be the means of providing something more substantial in the shape of specimens, as well as the accumulation of facts of great importance to science.

I hope, therefore, to see in the pages of the 'Entomologist,' next season, many notes, the result of practical observations, bearing upon this interesting subject.

195, Ladywood Road, Birmingham, Nov. 5, 1893.

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. de Vismes Kane, M.A., M.R.I.A., F.E.S.

(Continued from p. 15.)

Eriogaster lanestris, *L.*—Very locally abundant. Ardrahan (*R. C.*) and near Galway (*A.*); Magilligan, abundant (*C.*), Co. Derry; and near Kilkenny.

Bombyx neustria, *L.*—Not known in the northern half of Ireland, but has apparently a similar distribution to that of *Dasychira pudibunda.* Ennis, Co. Clare (*Br.*); near Cappagh, Co. Waterford (*Miss V.*); Killarney, two (*W.*); Castle Taylor, Co. Galway, abundant (*Miss N.*); one at Clondalkin, Co. Dublin, Mr. Grierson.

Bombyx rubi, *L.*—Universally distributed from Inishowen to Donegal (*W. E. H.*), to Westmeath and southwards to Killarney, &c., and from Howth to Dublin to the Co. Galway (*R. E. D.*) in the west.

Bombyx quercus, *L.*, var. *callunæ*, Palmer.—Very common, and universally distributed. Mr. Birchall says that he has never met with the type in Ireland. I am of the same opinion. Two examples are, however, reported in the E. Mo. Mag. iv. 283, from Cromlyn (*Mrs. B.*), and Queenstown, Mr. Bond. The insect usually seems to hybernate as a larva. An example is recorded by Mr. Watts, however, taken at Killarney, June 22nd, 1890, nearly full-fed. It spun up at the end of July, and emerged the following June 21st. A female, with hind wings very dark brown like the male, is in the Rev. James Bristow's collection.

Odonestis potatoria, *L.*—Widely distributed, and occasionally common locally. At Ahascragh, very abundant (*R. E. D.*), and near the town of Galway (*A.*); near Enniskillen (*S.*); Markree Castle, Sligo; Favour Royal, Tyrone; Churchill, Co. Armagh (*J.*), &c.

SATURNIIDÆ.

Saturnia pavonia, *L.*—Distributed throughout Ireland, and often pretty common. I have taken it in Donegal, Antrim, Tyrone, Monaghan, Fermanagh, Westmeath, King's Co., Tipperary, Dublin, Wicklow, Waterford, Cork, Kerry, Galway, Roscommon, and Sligo. The Rev. James Bristow has a remarkable specimen, whose fore wings are of the female pattern, and the hind wings male.

DREPANULIDÆ.

Drepana lacertinaria, *L.*—Occurs in almost every locality that I have had the opportunity of examining; and is common occasionally. Buncrana, Co. Donegal, pretty numerous (*C.*); L. Gill and Markree Castle, Co. Sligo; Clonbrock, abundant (*R. E. D.*), and Ardrahan, one, Mr. Harker, Co. Galway; Hollybrook, L. Arrow (*Miss ff.*), Co. Roscommon; Mohill, Co. Leitrim; Enniscoe, Co. Mayo, abundant; Altadiawan and Favour Royal, Tyrone; Cromlyn (*Mrs. B.*) and Killynon (*Miss R.*), Westmeath; Glendalough, Co. Wicklow; Kenmare and Killarney, Co. Kerry, &c.

Drepana falcula.—Enniscoe, Co. Mayo; Favour Royal, Tyrone; Clonbrock, Co. Galway (*R. E. D.*). This seems a rare insect in Ireland, only four specimens having yet been recorded. Mr. Birchall gives Co. Kerry as a locality.

Cilix glaucata, *Scop.*—Widely spread, but not generally at all numerous. Howth, one (*M. F.*), and at Drumcondra, Co. Dublin; Greystones, Co. Wicklow; Favour Royal, Tyrone; Armagh (*J.*); Clonbrock, not frequent (*R. E. D.*), and Galway (*A.*); Killynon (*Miss R.*), Westmeath; Banagher, King's Co.

DICRANURIDÆ.

Dicranura furcula, *L.*—Not by any means often met with in Ireland; but Stephens (under the synonym *bicuspis*) records that it is not very uncommon near Dublin, according to his correspondent Rev. J. Bulwer. Mr. Dillon having reported it very abundant at Clonbrock, Co. Galway, I beat for the larvæ, and found them very plentiful. Examples have been taken at Cromlyn (*Mrs. B.*), Westmeath, Farnham, Co. Cavan; near Stranorlar, Co. Donegal; Enniscoe, Co. Mayo; and Derry (*C.*).

Dicranura bifida, *Hb.*—Apparently rarer than the preceding. I have taken it at Markree Castle, Co. Sligo; one near Derry (*C.*).

Dicranura vinula, *L.*—Everywhere common. I have taken it in the extreme north of Co. Donegal; and Mr. Wm. Hart on Malin Head.

Stauropus fagi, *L.*—One example only as yet taken in

Ireland, near Kenmare, by Miss Vernon, who did not recognise her capture.

NOTODONTIDÆ.

Ptilophora plumigera, *Esp.*—There is a specimen of this species in Mr. Dillon's cabinet, taken in September, 1892, attracted by a light in a window at Clonbrock, Co. Galway.

Pterostoma palpina, *L.*—This insect seems, though widely distributed, never to be taken, except very sparingly. One in Wicklow near Tinahely (*Bw.*); Miss Nugent took several at Ardrahan, Co. Galway; I have met with it at Mucross, Killarney, Altadiawan, Tyrone; and one flew off sugar at L. Oughter, Co. Cavan.

Lophopteryx camelina, *L.*—The larvæ may be met with in most parts of Ireland, not rarely. I give a few localities: Howth and Cabinteely, Co. Dublin; Co. of Wicklow and Waterford; Kenmare, Co. Kerry; Favour Royal, Tyrone; Drumreaske, Monaghan; Armagh (*J.*); abundant at Powerscourt and Killarney (*B.*); shores of L. Conn, Co. Mayo, abundant; Mote Park and L. Arrow, Co. Roscommon; Ardrahan (*Miss N.*) and Clonbrock, very abundant (*R. E. D.*), Co. Galway; Markree Castle, Co. Sligo; Killynon, Westmeath; and Inishowen, Co. Donegal (*W. E. H.*).

Notodonta bicolor, *Hb.*—The capture of this rare moth at Killarney near Dinas, in 1859, by the late Peter Bouchard, then employed to collect for the British Museum, made a considerable sensation in the entomological world, as it had hitherto only occurred at Burnt Wood, Staffordshire. The first capture was followed by another specimen in 1860, found in a spider's-web. Another was got in Mucross demesne, six years later, by Mr. John Hardy, and larvæ were said also to have been beaten. But for many years this insect has been watched for in vain. In 1892, however, Miss Vernon, of Clontarf, showed me her collection of insects from Kerry, and besides the specimen of *Stauropus fagi* above referred to, I found two rather poor specimens of *Notodonta bicolor* from a new locality in Kerry. Miss Vernon is under the impression that it is not very rare there, for she says she recognised the wings more than once detached on the ground, the moth having been eaten by a bat. It is satisfactory to have evidence that this rarity is not extinct in Ireland, as Miss Vernon's capture is beyond question genuine.

Notodonta dictæa, *L.*—Widely spread, but not, I think, often numerous. Powerscourt, Co. Wicklow (*B.*); Howth (*G. V. H.*); near Belfast (*Bw. & W.*); Cromlyn, not rare (*Mrs. B.*); Westmeath; Derry (*C.*); Crossmolina (*S. R. F.*); Co. Mayo; Knocknarea Russ, Co. Sligo; Clonbrock, one (*R. E. D.*).

Notodonta dictæoides, *Esp.*—Apparently less rare than the preceding. I have beaten the larvæ at Farnham, Co. Cavan; Hollybrook, L. Arrow, Co. Roscommon; Cookesborough, Westmeath; near Favour Royal, Co. Tyrone; and Enniscoe, Co. Mayo, not infrequently. Mr. Birchall also found it not rare at the foot of Powerscourt waterfall, Co. Wicklow; Howth (*G. V. H.*) and Rathfarnham (*Bw.*), Co. Dublin; Buncrana (*C.*), Co. Donegal.

Notodonta dromedarius, *L.*—Very widely distributed, and common. The typical form has been said not to exist in Ireland, but to be replaced by the var. *perfusca*. But it would appear to me that the Irish insect is intermediate between the chestnut-coloured form of the South of England and the very dark purplish Scotch var. *perfusca* from Perth. I have seen some Irish examples of a warmer tint than most English specimens, and very similar to those taken in the Leigh woods at Clifton, and the New Forest. Howth (*G. V. H. & M. F.*); Powerscourt (*Bw.*), Co. Wicklow; Cromlyn (*Mrs. B.*), Westmeath; Markree Castle, Sligo; Cloghan near Stranorlar, Co. Donegal; Derry (*C.*); Favour Royal, Tyrone; Clonbrock (dark form), very abundant (*R. E. D.*), Co. Galway; shores of L. Conn and Glenmore (*S. R. F.*), Mayo, abundant.

Notodonta ziczac.—As the above in distribution and occurrence, and found in the same localities; also at Killynon, Westmeath (*Miss R.*); and Armagh (*J.*).

Notodonta trepida, *Esp.*—"Not uncommon in the Co. Wicklow" (*B.*). I have no information.

Notodonta chaonia, *Hb.*—Mr. Birchall had a specimen taken at Killarney. I took two at Derrycunnihy on the Upper Lake, 1885. It is reported to have occurred in Co. Wicklow (*B.*). At Clonbrock numerous specimens were taken in Mr. Dillon's moth-trap, two of which he sent me, which agree with the Killarney examples in very large size, a purer white ground colour than the generality of English *chaonia* that I have seen, with the pattern strongly marked.

Notodonta trimacula, *Esp.*—Not uncommon at Killarney (*B.*). I have never seen an Irish example of this species.

PYGÆRIDÆ.

Phalera bucephala, *L.*—Abundant everywhere.

Pygæra curtula, *L.*—"Larvæ near Clonmel, Co. Tipperary" (*B.*); I also took the larvæ in July, 1883, at Mote Park, Co. Roscommon, and near Clonbrock, Co. Galway; and Mr. Watts reports the same as abundant the same date at Newcastle, Co. Down. The imago has, however, not yet been bred. As, however, the larvæ were almost full-fed when I took *P. pigra* in the act of oviposition, I think I may venture to record the species as Irish.

[*Pygæra anachoreta*, Fb.—Mr. Burchall turned out the larvæ of this moth at Howth, but apparently the attempt to plant the species has resulted in failure.]

PYGÆRA PIGRA, *Hufn.*—Very widely distributed, and abundant, but easily overlooked. Irish and Perth examples seem to be of a richer coloration than English. I have taken the larvæ and bred the imago from the following localities:—Buncrana and Cloghan near Stranorlar, Co. Donegal; shores of L. Conn, Co. Mayo; Favour Royal, Tyrone; Killynon, and Cromlyn (*Mrs. B.*), Westmeath; Mohill, Co. Leitrim; Kenmare (*Miss V.*), Co. Kerry; Newcastle (*W.*), Co. Down; near Galway, abundant (*A.*).

(To be continued.)

REMARKS ON CERTAIN GENERA OF *COCCIDÆ*.

BY W. M. MASKELL.

THE study of Coccids is extending, and new workers are entering the field every day, so that ere long this greatly neglected family of insects will receive all the attention which it certainly merits. There exists still, on account of the careless way in which entomologists until late in this century discussed specimens which came in their way, and also of the very fragmentary and unintelligent descriptions of species given, a good deal of confusion in Coccid classification. The time has nearly, if not already, arrived when a monograph of all known Coccids, embodying a proper synopsis and sequence of genera and species, can be advantageously undertaken: and, after twenty years' study of the family, I have ventured to take some preliminary steps towards such a monograph, in the hope that health and time may permit me to complete it.

Meanwhile, I find it necessary to draw attention to a few points in classification, and to endeavour to clear up some confusion which seems to have arisen on various points. There are persons who despise classification, calling systematizers mere mechanical catalogue-makers; and certainly there seems to be some little justification for this, in cases where authors have multiplied species recklessly, founding them on single or imperfect specimens or insufficient characters. Sometimes, of course, one specimen may be found as to which there can be no shadow of a doubt, and which may properly be separated from all others. But the man who *habitually* erects new species, and even new genera, to suit trivial features of a single specimen collected by him or sent to him, ought to be scouted and "sent to Coventry" by all true lovers of science. Properly undertaken and thought out, a systematic catalogue is essential to real knowledge. Coccids suffer a good deal from the want of one.

A further reason for desiring such a thing is that the older (and I am sorry to say some of the modern) students of Coccids have been unable to travel out of the grooves of what I may call "ordinary" entomology; I mean the determination of species from external appearance and characters. Colour, size, general form, apparent structure of the secreted coverings, have been considered as of primary importance. On the other hand (rightly as it seems to me), I have always insisted that true Coccid classification should depend upon the anatomical characters of the insects themselves, and that mere external features, visible to the naked eye or an ordinary lens, are but secondary. A lepidopterist may get on capitally without using a microscope at all; a coccidist would fall into innumerable errors without one.

Dactylopius nipæ, Mask. and the tubercles of *Dactylopidæ*.

In Vol. xxv. of the 'Transactions of the New Zealand Institute, 1892,' I described under the above name an insect from Demerara, on *Nipa fruticans*. Mr. R. Newstead had received, unknown to me, specimens of the same species, and has published a description of it in the 'Entomologists' Monthly Magazine,' August, 1893, at which time he was not aware of my paper in the 'Transactions.' There are a few discrepancies between these two accounts of the insect, on which I have sent some remarks to Mr. Newstead; they are not important, with the exception of one which I proceed now to notice, as it affects the question of classification generally.

Following partly Dr. Signoret, I have ever since 1878 made the principal characters separating the *Dactylopidæ* from the *Acanthococcidæ* to consist of the antennæ, the anal ring, and the processes at the abdominal extremity to which I have given the name of "anal tubercles." In my 'Scale Insects of New Zealand, 1887,' I gave figures illustrating the anal rings, and in my paper of 1891 drew attention to the differences in the antennæ. There is thus no necessity to refer now to these points; but with regard to the tubercles the remarks of Mr. Newstead as to *D. nipæ* lead me to treat these organs in some detail.

After stating that in *D. nipæ* the tubercles are "very large," he says:—"In the form of the antennal joints it is clearly Dactylopid, but the very conspicuous anal lobes are abnormal." I am unable to accede to this proposition; neither can I agree to refer the species to *Rhizococcus* or to any genus of the *Acanthococcidæ*.

The subdivision *Dactylopidæ* consists of such genera as *Dactylopius*, *Ripersia*, *Orthezia*, &c. The *Acanthococcidæ* include *Eriococcus*, *Gossyparia*, &c. Now, in absolute strictness, I suppose that we ought not to look upon the tubercles of, say, *Eriococcus* and *Dactylopius* as morphologically distinct at all. In both cases they seem to be only processes visible at each side of the abdominal extremity, and they always bear a more or less numerous arrangement of hairs and spines. Carrying this view a little further, we might say that they correspond sufficiently with the abdominal lobes of the Lecanids. But, when we come to attempt a clear and convenient classification, we find that the forms (*Acanthococcidæ*) possessing antennæ with short terminal joints and anal rings with eight hairs, exhibit almost always tubercles differing considerably from those of the forms (*Dactylopidæ*) with long terminal joints and anal rings with six hairs. Some of the *Acanthococcidæ*, e.g., *Rhizococcus casuarinæ*, Mask., or *Eriococcus turgipes*, Mask., have comparatively small tubercles; some *Dactylopidæ*, e.g., *Dactylopius nipæ*, Mask., or *Ripersia fagi*, Mask., have comparatively large ones. Yet there is a very long way between them, and there is no mistaking their character.

The form of the tubercles in a Dactylopid is usually rounder and less cylindrical than in an Acanthococcid; the spines and setæ, where they occur, are more scattered; and the margins are much less irregular. As a rule also they appear to be less chitinous. After treatment with potash, it will usually be found that the feet, antennæ and rostrum of a specimen remain of a much darker colour, with more solid appearance, than the rest of the body; so also do the abdominal lobes of a Lecanid, or the anal tubercles of an Acanthococcid. But the tubercles of a Dactylopid seem generally to be less hard. There are exceptions, as in *Ripersia fagi*, where the tubercles remain slightly darker, but these are few. Even in *Eriococcus turgipes* the tubercles, though small, are conspicuously dark and hard.

Some *Dactylopidæ* have the tubercles reduced nearly to a mere dot; in others they seem altogether obsolete: examples may be seen in *Dactylopius adonidum*, *D. calceolariæ*, *Ripersia tomlinii*, *Pseudococcus asteliæ*, &c. And I do not doubt that somebody will arise, some day, fastidious enough to separate under new subgenera the species with very minute from those with more noticeable tubercles. The time for this hair-splitting does not seem to me to have yet arrived.

The tubercles of *D. nipæ* are fairly large for the genus, and they approach those of some *Ripersiæ;* and it was partly on this account (in addition to the cottony processes) that in 1892 I stated that it might almost be a *Ripersia* if other characters did not forbid it. I cannot detect any Acanthococcid feature in it. In the next volume of our 'Transactions' I propose to give some figures illustrating the differences in the anal tubercles which have just been mentioned.

Wellington, New Zealand, Oct. 12, 1893.

(To be continued.)

NOTES ON THE SYNONYMY OF NOCTUID MOTHS.

By Arthur G. Butler, Ph.D., F.L.S., &c.

(Continued from vol. xxvi. p. 355).

Blosyris turdipennis.

Blosyris turdipennis, Guenée, Noct. iii. p. 138, n. 1519 (1852).
B. lusciniæpennis, Guenée, *l. c.*, p. 139, n. 1520 (1852).
Latebraria cinctilinea, Walker, Lep. Het. xiv. p. 1283, n. 4 (1857).
Hypernaria patula, Walker, *l. c.*, Suppl. 3, p. 1085 (1865).
Bogota, Ega, Espiritu Sancto. In Coll. B. M.

Blosyris helima.

Phalæna helima, Cramer, Pap. Exot. iv. p. 43, pl. cccix. fig. D (1782).
Var. *Erebus rengus*, Poey, Cent. Lep. Cuba, pl. 7 (1832).
Brujas posterior, Walker, Lep. Het. xiv. p. 1252, n. 5 (1857).
Letis intracta, Walker, *l. c.*, p. 1266, n. 8 (1857).
Amazons. Var. St. Domingo and Jamaica. In Coll. B. M.

Peosina, *Guen.*

Peosina mexicana.

♂ *Peosina mexicana*, Guenée, Noct. iii. p. 132, n. 1508, pl. 19, fig. 2 (1852).
♀ *Peosina saundersii*, Guenée, *l. c.*, p. 133, n. 1509 (1852).
St. Domingo. In Coll. B. M.

Under this species Walker placed *P. numeria*, and under the latter something entirely different, which fact explains his observation under *P. numeria*. The latter comes both from Jamaica and St. Domingo, as well as Honduras. It may, I think, be only a form of the above species; but without transitional forms I prefer to keep it distinct.

Peosina leontia.

Phalæna leontia, Stoll, Suppl. Cram. Pap. Exot. v. p. 155, pl. 34, fig. 6 (1791).
Melanchroia? leontia, Walker, Lep. Het. ii. p. 389, n. 6 (1854).
Peosina trifinis, Walker, *l. c.*, xiv. p. 1246, n. 10 (1857).
Trinidad and Brazil. In Coll. B. M.

The species identified by Walker as *P. isone*, I believe to be *P. ochrolinea*. The true *P. isone* is in the museum collection from Sao Paulo.

Achæa, *Hübn.*

Section *Ophisma*, Guen.*

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* M. Guenée says of *Achæa* (which he places after his genus *Ophisma*); "Ce genre est bien naturel et facilement reconnaissable sans que j'insiste sur ses caractères." Unfortunately, this is exactly what every scientific worker must do. Genera, founded on pattern, make pretty groups; but structure distinguishes true genera.

Ophisma mezentia.

Phalæna mezentia, Cramer, Pap. Exot. iv. p. 70, pl. cccxxiii. fig. F (1782).

Sypna lugens, Walker, Lep. Het. Suppl. 3, p. 938 (1865).

Ceylon. In Coll. B. M.

I believe that *A. reversa*, Walk. (Lep. Het. xiv. p. 1399, n. 18), is nothing more than a variety of this species. The extreme variability of the species of *Achæa* is well known; and, therefore, the mere obliteration of the pale markings on the primaries is not likely to be of specific value.

Ophisma ezea.

♀ *Phalæna ezea*, Cramer, Pap. Exot. iii. p. 78, pl. ccxxxix. fig. D (1782).

♂ *Achæa ezea* var.?, Walker, Lep. Het. xiv. p. 1391, n. 1 (1857).

♀ *Ophisma dejeanii*, "Boisduval, Faune Ent. de Madag. p. 102, n. 3, pl. 15, fig. 4" (1833); see Walker, Lep. Het. xiv. p. 1395, n. 9 (1857).

West Africa. In Coll. B. M.

In spite of the similarity of the West African specimens to Boisduval's figure, I believe that Walker is wrong in his identification, and that the true "*O. dejeanii*" of Boisduval is a dull form of the species subsequently described and figured by Guenée as *Ophisma præstans;* the broad apical ochreous patch of the secondaries favours this view. It is significant, as evidencing the value of the generic characters by which M. Guenée declines to distinguish the genera *Ophisma* and *Achæa*, that, whilst he calls his own species an *Ophisma*, he places Boisduval's in *Achæa*.

NAXIA, *Guen.*

Naxia tropicalis.

Ophisma tropicalis, Guen., Noct. iii. p. 238, n. 1651 (1852).

O. detrahens, Walker, Lep. Het. xiv. p. 1368, n. 2 (1857).

O. luteiplaga, Walker, *l. c.*, p. 1369, n. 3 (1857).

O. confundens, Walker, *l. c.*, p. 1372, n. 9 (1857).

O. stigmatifera, Walker, *l. c.*, p. 1387, n. 39 (1857).

O. fugiens, Walker, *l. c.*, n. 40 (1857).

Mexico, "West coast of America," St. Domingo, Bogota, Rio Janeiro. In Coll. B. M.

This is somewhat variable in colouring, but not in pattern.

Naxia certior.

Ophisma certior, Walker, Lep. Het. xiv. p. 1381, n. 28 (1857).

O. contenta, Walker, *l. c.*, n. 29 (1857).

♀ ♀. Moulmein. Types in Coll. B. M.

Naxia illibata.

Noctua illibata, Fabricius, Ent. Syst. iii. 2, p. 16, n. 25 (1794).
Hemeroblemma peropaca, Hübner, Samml. Exot. Schmett. Zutr. figs. 541, 542.
Ophisma lætabilis, Guenée, Noct. iii. p. 241, n. 1657 (1852).

Hong Kong, Moulmein, Ceylon, Silhet. In Coll. B. M.

Fabricius' type is in the Banksian collection.

Naxia lageos.

Naxia lageos, Guenée, Noct. iii. p. 256, n. 1680 (1852).
Ophiusa umbrosa, Walker, Lep. Het. Suppl. 3, p. 968 (1865).
O. obumbrata, Walker, *l. c.*, p. 969 (1865).

Java, Shanghai, South India, Nilgiris. Type in Coll. B. M.

ACHÆA, *Guen.* (typical).

Achæa lienardi.

Ophiusa lienardi, Boisduval, Faune Ent. de Madag. p. 102, pl. 15, fig. 5.
Achæa chamæleon, Guenée, Noct. iii. p. 249, n. 1671 (1852).
Vars. *cerbera* and *zabulon*, Guenée, *l. c.*, p. 250 (1852).
Achæa spectatura, Walker, Lep. Het. xiv. p. 1393, n. 6 (1857).
A. ophismoides, Walker, Proc. Nat. Hist. Soc. Glasgow, 1869, p. 367, n. 45.
A. partita, Walker, *l. c.*, p. 358, n. 46.

Africa generally. In Coll. B. M.

A very variable species as regards the upper surface of the primaries.

Achæa melicerte.

Phalæna melicerte, Drury, Ill. Exot. Ins. i. p. 46, pl. 23, fig. 1.
Achæa catilla, Guenée, Noct. iii. p. 247, n. 1667.

Asia, Africa, Australasia. In Coll. B. M.

We have an immense series of this moth. It is quite useless to attempt to recognize more than one species under its numerous slight variations. It has been described by Fereday from New Zealand as a *Catocala;* but I have lost the reference to his description and woodcut.

Achæa mercatoria.

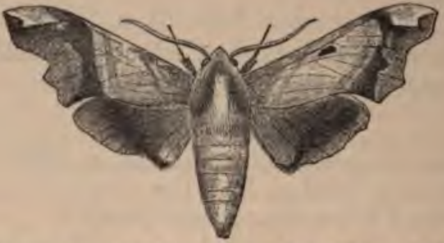
Phalæna mercatoria, Gmelin, ed. Syst. Nat. i. 5, p. 2544 (1788)
Achæa accelerans, Walker, Lep. Het. xiv. p. 1401, n. 23 (1857)

Java, Ceylon, India. In Coll. B. M.

(To be continued.)

DESCRIPTION OF AN ABERRANT *SMERINTHUS TILIÆ.*

By Charles Rothschild.



This specimen was bred in June, 1893, from a larva found at Tring, Herts, September, 1892. It chiefly differs from the typical form of the species by the entire obliteration of the central markings in the fore wings on the one side, while on the other they are only represented by a very small blackish green spot at the end of the cell. The basal part of the fore wings is pinkish grey, while the apical portion is of a dark green; the marking at the apex of the costa is of the normal shape and colour. The hind wings are almost entirely black, very faintly tinged with buff on the nervules. On the under side the usual streaks are somewhat indistinct. The example is a male, and expands 2·35 inches.

Tring Park, Tring, Herts.

HYPENA DAMNOSALIS, Walk.

By A. G. Butler, Ph.D.

Professor Smith may rest assured that my identification of Walker's type is correct; the species is too well marked for any one having type and description before him to make a mistake.

Since the Professor has gone so far as to thank me for calling attention to the above point, I am encouraged to mention another mistake, perhaps due to the fact that Walker's type is an unset and not very fine example, viz.: *Hypena idæusalis*, Walk., is certainly not Grote's *H. citata*, nor is it like it; in fact, it is not even a *Hypena*. *Bomolocha citata*, Grote, is =*exoletalis*, Guen.

However certain I may be of the correctness of my determinations, the many doubts which Professor Smith has recently expressed respecting them have made me careful to ask the opinion of other qualified entomologists before publishing them; so that in the mouth of two or three witnesses every word may be established.

PROTECTIVE RESEMBLANCES IN S. AMERICAN INSECTS.

BY W. C. MIT.

DURING a visit to Brazil in the latter months of 1888, I had about six weeks of pleasant enforced leisure at a friend's house on one of the thickly wooded hills overlooking the harbour and town of Santos. During this time, and also while at S. Paulo, Tijuca, and Petropolis, I employed myself in making a collection of butterflies, of which there is a great profusion and variety in Brazil. Not being an entomologist, my chief object was to bring home with me to Europe insects enough to make up some pretty cases, and to gratify a curiosity for natural history.

During the time I was collecting several observations struck me as possibly of interest in connection with the subject of protective resemblances, and I now mention some of them with a view towards contributing, however little, to the further elucidation of the subject.

While on a subsequent visit to England, some of the butterflies collected by me were reset and named through Messrs. Watkins & Doncaster, of the Strand.

The protective resemblances of butterflies in Brazil is, if I may so paradoxically express it, more apparent when permanently settled at rest than when flying through the air, or temporarily settled on a flower. In this respect they resemble European butterflies. There are many Brazilian butterflies which, when they display fully their charms of colour, pattern, flight, and metallic sheen, are very conspicuous objects in the bright sunshine, and yet, when at rest and alarmed, it is remarkable what retiring and inconspicuous objects they become. Some appear to be defended while on the wing by rapidity of flight, such as the Papilios, *Colænis julia* (Fabr.), *Anosia erippus* (Cram.); others by a zigzag and apparently erratic flight, such as the large blue *Morphos*, so common about Tijuca, near Rio, the whites and the yellows. *Eunogyra* and others, when they settle, have a habit of putting themselves on the under side of a leaf, flattening out their wings horizontally when at rest, being thus invisible, except from directly underneath.

Some butterflies have slight thin bodies and transparent wings, such as *Ithomia*. These frequent the undergrowth of woods, especially in the neighbourhood of open glades or places where the rays of the sun glance down through the upper growth of trees, and it is surprising to one when first observing this butterfly flying through the undergrowth of its native woods how more inconspicuous they are practically than one would have expected. The dancing flight through the bushes, and the transparent gauzy wings with black borders, harmonise with the dancing shadows of the leaves above.

The Heliconidæ, to which the Ithomiæ belong, are, if I remember rightly, confined to the South American continent, and many of them have a slow, steady, horizontal flight and conspicuous brilliantly-coloured wings. They appear thus to have no protection from the attacks of birds, and some naturalists (? Wallace) have founded on this circumstance the hypothesis that they possess the invisible protection of containing in their bodies some substance rendering them distasteful to birds. This supposition may be correct as regards the larger and more brilliantly-coloured species, but the smaller transparent species would appear to depend for protection on their inconspicuousness, if not entirely, at all events to some degree. It would therefore be interesting were investigations to be made with a view to finding out, by chemical analysis or otherwise, what the substance may be which renders some butterflies distasteful to birds, and whether it be equally present in inconspicuous as in conspicuous butterflies.

Brazilian butterflies, when at rest, possess many and varied contrivances of protective resemblances for safety. They generally settle on the lichen-covered tree-trunks, and are, when settled, so wonderfully like their favourite resting-places that they become almost invisible. Such a butterfly is *Ageronia feronia*, Linn. This is the species mentioned in Mr. Bigg-Withers' 'Pioneering in Brazil' as the "whip-butterfly," owing to the sharp whip-cracking sound made by its wings when battling with its fellows in the air. When at rest it usually remains with its wings spread horizontally, and the tips pressed against the grey lichens or bark of the tree-trunk. They generally settle at a height of two or three yards from the ground. This butterfly is then so like in colour and markings to the surface on which it rests that it is practically invisible at the distance of even a few yards. Its disposition is most pugnacious, and should a butterfly of the same or even of a different species approach it, it sallies out at a tangent with a strong swift flight, and buffets it boldly, making the crackling noise noticed by Mr. Bigg-Withers. It is remarkable that the under sides of the wings of this species are lighter coloured and more ornamental than the upper, which is the protected side. According to Mr. Bigg-Withers, a forest bird called the "suruqua" feeds chiefly on butterflies, and is partial to this species, being attracted by the whip-like crack, and darting after it on the wing. I was not so fortunate as to see this bird or any other pursuing butterflies, and in fact it is difficult to discover which are the butterflies' natural enemies.

Dr. Hans Gadow, of Cambridge, informs me that his captive chameleons display a great partiality for butterflies as food, and I once discovered a centipede with a moth in its mouth. I have seen house sparrows occasionally chase cabbage butterflies, and beyond this I have not had opportunities of finding out what their persecutors may be. Judging from their protective coloration (when at rest) they would appear to be numerous and ever present.

Gynæcia dirce, Linn., is another butterfly frequenting rather similar localities to *Ageronia feronia*, but when at rest it closes its wings vertically, and then the elaborate network pattern of dark yellowish brown on a creamy yellow ground matches the lichens covering the tree-trunk on which it rests. The upper side had a conspicuous broad yellowish white bar diagonally across the upper wing on a dark ground.

These two butterflies are good illustrations of the general proposition that the protective colouring and markings are applied to that portion of the insect which is exposed when at rest, the presumable position of danger. We see this illustrated also in the large European red under-wing moth, which, flying by day, displays in flight the bright crimson lower wing, and is almost invisible directly it alights on the lichen-covered boulders, where the grey-patterned upper wings fold flat over and hide the gaudy lower ones. It is very suggestive also to watch how instinctively and probably unconsciously the European grayling butterfly shrinks down the eye-spot, the only conspicuous part of its under side, and shuts it out of sight beneath the under wing directly it is alarmed by any sudden motion on the part of the spectator.

The butterflies which frequent woods in Brazil are an interesting study from many points. They are dark in colour—blacks, browns, dark blues, and dull yellows. One would judge from this that their enemies are more numerous in woods than in the open fields.

Pierella lena, Linn.: a dark yellowish brown is the colour of the dead leaves of the forest trees, over which it flits in a weird gnome-like manner a foot from the ground, choosing in preference to follow the course of a stray leaf-covered forest pathway. The under side of the wings still more closely resembles the dead leaves, even to the veinings and a peculiar dried-surface semitransparent lustre. It is easily overlooked when resting, as it usually does, on the dead fallen leaves, the wings closed, and showing only the under side with its imitative veinings. There is a closely allied species with similar habits, which has orange-brown patches on the lower wings, and it is a curious circumstance that while these render this butterfly conspicuous while flying, the upper wings are semitransparent, dark brown in colour, and to all appearance calculated to resemble the dead leaves over which it flies, and thus tends towards concealment. The under side of the wings is quite sombre and protective in coloration.

Myscelia orsis, Drury, is of a beautiful dark velvety blue on the upper side, and dull purple-brown on the lower. It frequents the small open glades of woods, and rests with its wings folded, thus concealing the showy upper side.

Taygetis euptychidia is a brownish black butterfly on both upper and under side, the latter having a few inconspicuous ornamental spots along the edge.

Eunogyra satyrus, Westw., is almost jet-black and plain on the upper side, black and somewhat unassumingly ornamented on the under side.

Most of the small butterflies frequenting thick woods are dark brown and inconspicuously marked. My experience was that the thicker the wood the fewer and smaller the butterflies it contained. The borders and large openings in woods are very favourite places for them, and the brighter coloured ones love to bask in the bright sun and flowers. On certain low scrub in full bloom I used to see clouds of butterflies of various kinds hovering and settling, chiefly whites and yellows.

Among the protective devices made use of there are some remarkable ones. I observed, at Santos, a white moth with peculiarly rounded wings, and when at rest with its wings fitted closely against the surface it presented a striking resemblance to a round splash of bird excrement. There was also a greyish-white *Curculio* beetle, which, when alarmed, curled itself up and lay quite still, with its legs folded. The round body then resembled the excrement of a gallinaceous bird. The wonderful resemblance which the "stick insects" bear to dry twigs is very familiar to all. They are numerous at Santos, and of various species.

The metallic lustre butterflies of Brazil are sun-baskers. Many South American butterflies suck the juices of ripe and decaying fruits. Such are the large blue *Morphos*. The immense owl butterfly, so called from its extraordinary resemblance to an owl, of the markings of the under side of its wings, with its large staring peacock eye-spots painted on its lower side, and the beak represented by the lower part of the body, is a crepuscular flyer, coming out from its concealment under the bushes about six o'clock in the evening, and flying up and down over the woodland streams. It is frequent near what used to be White's Hotel at Tijuca, a lovely suburb of Rio Janeiro. The wood moths are mostly sombre in coloration, and suit the darkness of the thick woods and scrub. There are some very large moths of a brownish black colour, with a subdued pattern in various shades. These harmonise well with the dry bracken and other ferns, among which they conceal themselves during the day.

A circumstance for which I was not prepared, and much surprised me, was the large proportion of species of black butterflies in Brazil. These have generally red and white ornamentation. The large gaudy yellow butterflies which frequent the yellow flowers of what looked like wild bananas have a very rapid, erratic flight. They are difficult of capture with a net, and one can well imagine that a bird also would have difficulty in catching them.

Where the profusion of butterfly life is so great as in Brazil, in the variety of species as well as in the number of individuals, there are more opportunities for observations and generalisations than in even the South of Europe. A visitor from the Old World finds his old familiar friends represented by new American cousins bearing a strong family likeness to those he has left behind him. The cabbage butterflies, brimstones, painted lady, tortoiseshell, swallow-tail, and many others, are represented in this manner.

What struck me most forcibly were the traces I noticed of two opposite and apparently conflicting influences on the ornamentation of the Brazilian butterflies. One of these influences, which no doubt is that which Darwin called Sexual Selection, leads to brilliant metallic colours, strong contrasts, and general display. The other, which is probably the necessity for concealment, tends to sombre colours and resemblance to the objects on which the insect settles. In most cases this latter influence can be traced modifying and checking the first. Sometimes one, sometimes the other, obtains the ascendancy. In some cases, as in certain wood butterflies, the necessity for concealment seems to have almost suppressed the ornamentation. Yet even in the protective markings may often be traced what looks like a subdued or struggling effort towards ornamentation. Of this nature may be many of the smaller eye-spots, markings, and dusky symmetrical curves and lines. Many butterflies which have a habit of opening their wings, turning round at the same time to display their finery, shrink up when danger threatens, and are then wonderfully inconspicuous. In a large number of Brazilian butterflies there is a pronounced tendency to a stripe passing over the upper wing on to the lower one, and symmetrical with it when spread open. This stripe is generally lighter coloured than the ground.

THE ILLUMINATED MOTH-TRAP.

By E. F. Studd.

Having now had my moth-trap in use for rather over a year, I think it may interest your readers if I give a list of my captures in it during that period, and add a few remarks on its working.

First, I would never recommend anyone to be discouraged if he fails to succeed with it at first, as, unfortunately, some of my correspondents have done. If the trap is made according to my direction, and the place is suitable, success sooner or later is a certainty. The principal thing is to select a suitable place. I have had all my best catches by setting the trap on the edge of a wood bordering a large heath, and now always keep a trap set there. It is not set so that the light goes over the heath, but facing along a glade near the edge of the wood, and running parallel to the heath from west to east. I cannot say why, but I have had all my best catches with the trap facing east. I have another trap, which I keep moving about, setting it in other spots which appear likely; and yet sometimes, on nights when the first trap has had a large catch, the second trap, often set within a quarter of mile, has had nothing, though set in a place to all appearance equally or even more likely. Hence it seems tolerably clear that a great deal depends on hitting on the right place. My experience is that, until you have given it a fair trial, you cannot tell whether a place is good or no. I always place the trap on a table, about two and a half feet high. I have tried various elevations, and I find this as good as or better than any. I would not recommend anyone to paint his traps white, as one of my correspondents has done, as that is calculated to affect the light proceeding from it; nor indeed to paint them at all, which, with the zinc covering, is quite unnecessary. I find it very little use to set the trap on moonlight or frosty nights; but wet, gusty ones I have found very good.

With these preliminary remarks, I will proceed to my list:—

Vanessa atalanta (1 specimen on September 19th; it clearly was attracted by light, as the trap was empty when the lamp was lit just after dusk, and the insect was there when the trap was visited before sunrise the next morning), *Macroglossa stellatarum* (1), *Nola confusalis*, *Calligenia miniata*, *Lithosia mesomella*, *L. lurideola* (in swarms, male and female), *Euchelia jacobææ*, *Arctia villica* (3 males), *Spilosoma mendica* (several males), *S. lubricipeda* (very numerous), *S. menthastri* (do.), *Porthesia similis*, *Psilura monacha* (males very numerous, 3 females), *Dasychira pudibunda* (males very numerous, and a few females), *Pœcilocampa populi* (males in swarms, and 4 females), *Odonestis potatoria* (1 male), *Cilix glaucata*, *Stauropus fagi* (1 male), *Lophopteryx camelina* (several males), *Notodonta dictæoides* (1), *N. trepida* (5), *N. trimacula* (2), *Phalera bucephala* (males), *Asphalia ridens* (4), *Demas coryli* (1), *Diloba cæruleocephala* (males), *Leucania conigera*, *L. lithargyria*, *L. pallens*, *Tapinostola fulva* (2), *Hydræcia nictitans*, *Xylophasia monoglypha*, *Neuronia popularis* (numerous males), *Charæas graminis* (1), *Luperina testacea*, *L. cespitis* (1), *Mamestra brassicæ*, *Grammesia trigrammica*, *Stilbia anomala* (3), *Rusina tenebrosa* (males in plenty), *Agrotis segetum*, *A. exclamationis*, *A. corticea*, *A. tritici* (3), *A. strigula* (numerous), *Noctua depuncta* (2), *N. plecta*, *N. c-nigrum* (1), *N. brunnea* (2), *N. festiva* (very numerous and varied), *N. umbrosa*, *N. xanthographa*, *Triphæna pronuba*, *Amphipyra pyramidea*, *Pachnobia rubricosa* (1), *Tæniocampa gothica* (numerous males), *T. incerta* very numerous and varied), *T. stabilis*, *T. munda*, *T. pulverulenta* (in swarms), *Orthosia macilenta*, *Anchocelis pistacina*, *A. lunosa*, *Cerastis vaccinii* (in swarms), *Scopelosoma satellitia* (white, deep orange, and yellow spots), *Dasycampa rubiginea* (2), *Xanthia citrago*, *X. flavago*, *X. aurago* (1), *X. circellaris* (3), *Calymnia trapezina* (very numerous and varied) *C. affinis* (1), *Dianthœcia capsincola* (1), *Miselia oxyacanthæ*, *Euplexia lucipara*, *Phlogophora meticulosa*, *Aplecta nebulosa* (3), *Hadena protea* (numerous), *H. dentina* (1), *H. thalassina* (2), *Xylocampa areola*, *Calocampa exoleta* (1), *Asteroscopus sphinx* (males very numerous), *Habrostola tripartita* (2), *Plusia chrysitis* (1), *P. gamma*, *Aventia flexula* (3), *Zanclognatha grisealis*, *Z. tarsipennalis*, *Hypena proboscidalis*, *Uropteryx sambucaria*, *Epione apiciaria* (1 male), *Rumia luteolata*, *Venilia macularia*, *Metrocampa margaritaria* (numerous males), *Ellopia prosapiaria*, *Pericallia syringaria*, *Selenia bilunaria*, *S. lunaria* (2), *S. tetralunaria* (2), *Odontopera bidentata*, *Crocallis elinguaria*, *Eugonia alniaria* (*canaria*) (1), *E. erosaria*, *E. quercinaria*, *Himera pennaria* (males in numbers), *Phigalia pedaria*, *Biston hirtaria* (3 males), *Amphidasys strataria* (6 males and 1 female), *A. betularia*, *Hemerophila abruptaria*, *Cleora glabraria* (several males and females), *C. lichenaria* (do.), *Boarmia repandata* (several, 2 of var. *conversaria*), *B. gemmaria*, *Tephrosia crepuscularia* (very numerous), *T. biundularia* (do.), *Pseudoterpna pruinata*, *Geometra papilionaria* (1 male), *Iodis lactearia*, *Hemithea strigata*, *Acidalia bisetata*, *A. subsericeata*, *A. remutaria*, *A. imitaria* (1), *A. aversata*, *Timandra amataria*, *Cabera pusaria*, *Bapta temerata*, *B. bimaculata* (2), *Macaria liturata*, *Panagra petraria*, *Numeria pulveraria* (several males), *Abraxas grossulariata*, *Hybernia rupicapraria*, *H. leucophæaria* (several, varied), *H. aurantiaria* (very numerous), *H. defoliaria* (in swarms, some very fine and striking vars.), *H. marginaria* (in swarms, several nice banded vars.), *Anisopteryx æscularia*, *Cheimatobia brumata*, *Oporabia dilutata*, *Larentia didymata*, *L. multistrigata*, *L. viridaria*, *Emmelesia affinitata*, *E. decolorata*, *Eupithecia nanata*, *E. vulgata*, *E. expallidata* (1), *E. minutata ?* (2), *E. lariciata*, *E. abbreviata*, *E. exiguata*, *E. pumilata*, *Lobophora carpinata* (1), *Thera variata*, *Hypsipetes sordidata*, *Melanthia ocellata*, *M. sociata*, *M. montanata*, *M. fluctuata*, *Anticlea badiata* (numerous), *A. nigrofasciaria* (1), *Coremia designata*, *C. ferrugata*, *C. unidentaria*, *Camptogramma bilineata*, *Cidaria siderata*, *C. miata* (1), *C. picata* (several), *C. truncata*, *C. immanata*, *C. suffumata*, *C. silaceata* (several), *C. fulvata* (1), *C. dotata*, *Eubolia plumbaria*, *Anaitis plagiata*, *Chesias spartiata*, *Pyrausta purpuralis*, *Herbula cespitalis*, *Eurrhypara urticata*, *Scopula ferrugalis*, *Botys asinalis* (1), *Pionea forficalis*, *Mimæseoptilus pterodactylus*, *Alucita hexadactyla*, *Crambus tristellus*, *C. geniculeus*, *C. culmellus*, *Aphomia sociella*, *Tortrix podana*, *T. viridana*, *T. ministrana*, *Leptogramma literana* (1), *Dictyopteryx læflingiana*, *Retinia pinicolana*, *Xanthosetia hamana* (1), *Tortricodes hyemana*, *Diurnea fagella* (grey), *Epigraphia steinkelneriana* (1), *Tinea semifulvella* (1), *Nemophora swammerdammella* (males), *Adela viridella* (males), *Phibalocera quercana* (males), and numerous other Micros I have not been able to identify.

Where in the above list I have not given the number taken, it is because the insect is a common one and has been taken commonly in the trap, and calls for no special remark.

Oxton, Exeter, January 1st, 1894.

THE CYANIDE BOTTLE.

By J. Arkle.

In the 'Entomologist' for April, 1893 (xxvi. 136), Mr. P. E. Radley, writing from Ceylon, contributes an interesting note on cyanide reaction. The queries put by the writer are, I believe, matters of such general interest that I venture to propose certain solutions, which, although drawn to a large extent from experience, are yet in some measure inseparable from conjecture.

First, as to the sloppy condition of the cyanide bottle. Mr. Radley presumes this is attributable to the damp climate of Ceylon. To some extent I believe this likely, but, not knowing his method of charging the bottle, and having no personal acquaintance with the climate of the island, it would be premature to give an unqualified affirmative. I would recommend every entomologist to charge his own bottle, and, in doing so, to remember that he is dealing with one of the most powerful absorbents—plaster of paris. Since its use, in this case, is to fix the potassium in the bottle (through its adhesiveness with glass when mixed with water), and allow the cyanogen to pass through its porous substance, it is important that as little water as possible be added in converting it from a powder into a paste. For a bottle to be carried in the waistcoat pocket (a pomade bottle), break up an ounce of cyanide of potassium; put it into a bottle. Place on a slate a small heap of plaster of paris; make a depression in the centre of the heap, and pour into the depression a little water, using the end of a disused table-knife the while to convert the powder into the stiffest paste. Take a little of this paste, and press it with the knife-handle on the potassium, and against the sides of the bottle. Add and press a layer of cotton-wool to receive the insects, and leave the plaster for a few minutes to dry. Then cork with a tight, well-sealed cork, and the bottle is ready for use, its contents being white and dry, or as white and dry as possible. In our climate it will be a long time before such a bottle becomes "sloppy," that is, before the plaster ceases to adhere and becomes mixed with water and loose potassium. As time goes on the collector will note that a dampness, not interfering with efficiency, *does* somehow affect the contents. Probably this is due to the admission of air (never dry) when using the bottle, and in a climate like that of Ceylon it may be reasonable to expect this effect intensified. If, however, in mixing the plaster of paris too much water be used, the collector may even *start* with a sloppy bottle.

As to its interference with insect colours, cyanide of potassium is one of the most powerful "bleachers" known, and it is difficult to see how a damp climate can act as a deterrent. On the contrary, dampness may be reckoned as an auxiliary in its attack upon colour. As an entomologist I have never known cyanide of potassium, used as described, affect any colour except green; but, with a treatment of wet cyanide, I have seen some startling "varieties" of Lepidoptera produced. Greens are among the most interesting of insect colours. Some, as in *Iodis lactearia*, appear to depend upon the supply of oxygen in life, and are therefore probably held in the circulatory fluid, as red is in that of the human subject. It has been suggested that this form of insect green is heightened by the wing-scales producing polarised light. Some greens are iridescent, as in the case of dragonflies, and are proof against dry cyanide. Others are not greens at all, as on the under wing-surfaces of *Pieris rapæ* and *P. napi*, but optical delusions resulting from a mixture of black and yellow scales. The green of such an insect as *Geometra papilionaria* may be taken as the type of a fourth class where a strong pigment seems present. Most of the lepidopterous greens, and certainly all the examples quoted, are peculiarly susceptible to the action of cyanide of potassium, and quickly change to a suggestive ochreous. Therefore, when it is recollected what a strong "affinity" cyanogen exhibits for certain metals, and that iron exists in animal circulatory fluids, it is not too much to suppose that these greens contain iron.*

After trying various methods, including the use of ammonia, for killing *G. papilionaria* so as to preserve the colour, I adopted the least of the evils, and carefully exposed the moth to *no more* than a fatal dose of the cyanide bottle, that is to say, whilst doing nothing more than terminating the respiratory functions, I removed the insect at once, so as to prevent cyanide saturation of the wing-tissue. The body of the moth, however, through spiracular inhalation of cyanogen, always turned ochreous, whilst the wings retained their natural green; but by-and-bye the rays assumed the ochreous tint. I am not acquainted with the *Catopsilia* referred to by Mr. Radley, but I strongly suspect that the reason why the "nervures" even "go green" is connected with the above illustration. This green may arise from contact of the cyanogen with some other ingredient than iron, the cyanogen reaching only the nervures, or rays, containing the main channels of transmission.

I have now reached Mr. Radley's last interesting query: "Is there any way," asks Mr. Radley, "to prevent them [green Noctuæ and Geometræ] changing colour?" I can thoroughly recommend for this purpose the "Killing Fluid" of Messrs. J. & L. Davis. I have used it constantly in the field during the past season, and therefore claim to be acquainted with its many merits. *It disturbs no greens;* it is quick in dealing with insects which appear to defy even the cyanide bottle, and it leaves the insect perfectly relaxed and fit for setting.

Chester, Dec. 12th, 1893.

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* Dry specimens might be burnt as a test for metal vapours.—J. A.

REMARKS ON *CHRYSOPHANUS DISPAR.*

By C. W. Dale, F.E.S.

First of all, there is a considerable difference in size, the smallest in my collection measuring one inch and five lines across the wings, and the largest two inches and two lines. It also varies in outline. My father took two male specimens at Trundle Mere, in Hunts, the fore wings of one being long and acute, and of the other short and obtuse; but they do not differ in any other respect. The male is of an effulgent coppery colour, with a larger and a smaller black spot on the fore wings. In the var. *rutilus* the second spot is absent. This variety has been occasionally taken in England, in company with the type. Haworth recorded it under the name of *hippothoë*. There is considerably more variation in the female. This sex has two larger black spots above the centre of each fore wing, and a row of seven between the centre and the hind margin, which is broader than that of the male. The outer rows of spots are elongated, like those of *Lycæna arion*, but vary somewhat in size, and I have a specimen in which the two middle spots of the row are larger than the rest. The hind wings of this sex are of a brown-black above, much irrorated with copper, the veins being copper-coloured, and running into a broad copper band near the hinder extremity, the edge itself being brown, with six triangular black-brown spots extending into the copper band, and giving it a lobed appearance.

The hind wings of some specimens are almost black, and, being hardly irrorated with copper at all, the broad copper band stands forth very distinct. I have one grand variety, almost black, with the markings much suffused.

Mr. Sidebotham had a variety of the opposite extreme, being of a silvery white, like the var. *schmidtii* of *C. phlœas.*

C. dispar was known to be a British species previous to 1790, and at one time was so numerous that Mr. Haworth took no less than fifty in a single day in Bardolph Fen. The latest capture appears to have been in 1847. I well remember one story my father used to tell. In 1819 he had in his employ an old boatman at Whittlesea Mere, Thomas Speechley by name. One day the other boatmen got round him, and asked him what he was about. "Catching butterflies worth a guinea apiece," was his reply. "They should like that work too," they said. Before my father's death, in 1872, specimens of *C. dispar* were actually selling for a guinea apiece; but how astonished he would have been at the idea of their selling at £6.

There is no doubt that an allied species, *C. virgaureæ* (the scarce copper), used to occur with *C. dispar* in the fen country. In addition to the published records in the 'British Naturalist,' vol. ii. p. 242, Mr. Briggs informs me he has a specimen taken by an uncle in Huntingdonshire many years ago. Mr. Stainton, and other authors who followed him, excluded it from the British list, but included *C. chryseis* (the purple-edged copper), a much more doubtful species: try two of the records—"Taken at Epping by a man,* name unknown; taken in Ashdown Forest, Sussex, by Mr. Plasted." Who was Mr. Plasted? The reputed captor of *hero*, *arcanius*, *catena*, *caloris*, and *equestrata*.

Glanville's Wootton, Sherborne.

NOTES AND OBSERVATIONS.

First and Last Appearances of Lepidoptera.—In the January number of the 'Entomologist' for 1893, I suggested that lists of first and last appearances of Lepidoptera observed throughout the year would be of interest. Between forty and fifty correspondents, residing in various parts of the country, intimated their intention of keeping records on the lines suggested; but I regret to add, so far, only some two or three of these have furnished me with any evidence of their having carried out their good intentions. Probably, however, the abnormally early emergence of many species during the first part of the season, and the scarcity of others later on, may have prevented many from recording their observations systematically. I am inclined, therefore, to believe that the small number of lists received is due to this, rather than to lack of interest in the matter.—Richard South; 12, Abbey Gardens, St. John's Wood, N.W.

Cerastis vaccinii var.—I see in the report of the Entomological Society of London (p. 72) that I am credited with the capture of this Noctua (var. of *rubiginea* or *vaccinii*). I did not take it here, but, as I thought I had shown, had merely received it from Berkshire as *Dasycampa rubiginea*. Will you kindly note this in your next number.—H. W. Livett; Wells, Somerset, January 7th, 1894.

Second Brood of Apatura iris.—This has been a year of surprises and remarkable appearances in the entomological world, and amongst the most extraordinary of these events may be placed the occurrence of a second brood of *Apatura iris*. In view of the fact that the young larva of this insect usually hybernates whilst in the third stage, and that the imago emerges the following June, a few notes on my experience this season may prove interesting. Whilst searching for larvæ in the New Forest, during the week ending August 9th, I found four specimens of *A. iris*. They were all in the second stage, and of course quite a month in advance of the usual time. On returning home I sleeved them on a fine healthy sallow, but on examination a fortnight later there were only three larvæ to be seen, one having probably been destroyed by earwigs—which swarmed in the garden—

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* Was this the same person (supposed to be a dealer) from whom J. F. Stephens, in 1817, received specimens of *Calophasia linariæ*, from Woodside, near Epping?

or some other enemy. From time to time I found the three larvæ which remained feeding and growing satisfactorily down to the end of September, when cold nights set in. At that time one of the larvæ was full-fed, another was in the fourth skin, whereas the third specimen had not advanced beyond the third stage. On October 7th, I opened the sleeve once more, and discovered that the smallest larva had disappeared, the largest was still healthy, and the remaining one was afflicted with scouring; it eventually died before reaching full growth. As the nights were growing colder I brought the two larvæ indoors, and placed them in the window of a room facing south. The full-fed larva continued to eat a little until the 13th inst., and during the night of the 17th inst. completed pupation. Twenty days afterwards, on Nov. 6th, fearing the pupa might perish, I removed it to the warmer atmosphere of the kitchen, taking the precaution to place a wet sponge in the breeding-cage. On the evening of the 9th inst. a female imago emerged, but, unfortunately, it proved to be a cripple. This may have been caused by being exposed to too high a temperature, as the larva appeared to be perfectly healthy up to the time of pupating, and I have little doubt would have emerged by the 11th or 12th inst. had it been allowed to remain in the cooler room. It will be observed from the preceding notes that these larvæ were fed under perfectly natural conditions, and therefore it is resonable to conclude that many other individuals of a second brood of *A. iris* have appeared in the New Forest during the present year.—C. H. Watson; Streatham Hill, S.W., December, 1893.

Second Brood of Larentia viridaria (pectinitaria).—Major Still, in his remarks on second broods of Lepidoptera in 1893 (Entom. 18), expresses himself doubtful whether a few specimens of the above-named species, met with at the beginning of September, ought to be regarded as a second brood or not, and states that he has never met with it so late before. I do not recollect having seen a second brood recorded, but I think there can be very little doubt that, as with so many species which ordinarily hybernate in the larval state, a few forward larvæ do feed up rapidly, and produce imagines in the early autumn. At Sandown I took a few specimens of *L. viridaria* in September, 1891 and 1892, but have never seen the species there during July or August. This exactly bears out Major Still's experience; and the similar occurrence in three consecutive years certainly goes against the idea that the September specimens might be merely casual examples of retarded emergence.—Louis B. Prout; 12, Greenwood Road, Dalston, N.E., January 11th, 1894.

Macroglossa stellatarum and Colour.—In reference to the abstract from the paper by Mr. Shaw (Entom. 21), is it not a fact that insects continue to visit the same species of flower during several successive hours? for if, on the contrary, an insect were first to visit a primrose, then a violet, and then a geranium, although the insect itself might feel no ill-effects, yet I fail to see how cross-fertilization of the flowers mentioned could be effected; and it would be even more difficult to account for those scarcer flowers which are more or less sparsely distributed in every locality. But in such a case as this a few simple observations are better, and (if accurate) must yield far truer results, than any theorising, however plausible the latter may appear. I think that the point has been determined in the case of bees; but I do not recollect having heard of any systematic series of similar observations on butterflies or moths, and I am sure that such would be quite worth making. Since in all departments of science one branch is continually encroaching on those around it, and since this seems to be especially the case with the kindred branches of zoology and botany, I do not think it is necessary for me to make any apology for introducing a note dealing largely with botanical subject-matter in an entomological magazine. Referring again to Mr. Shaw's most interesting paper, I do not think that the Viola in question was necessarily more attractive to humming-bird hawk-moths in general than the double geranium, but merely that this particular specimen had acquired a taste for that particular kind of nectar on the day in question.—F. P. BEDFORD; 326, Camden Road, N., January 2nd, 1894.

I was much interested in reading Mr. Shaw's notes upon the habits of *Macroglossa stellatarum* (*ante*, p. 21). It is a striking instance of the chromatic sight of insects. The occurrence he observed is, I think, in opposition to the general rule, viz., that inconspicuous flowers are less fertilised by insects than bright-tinted ones. Perhaps the honey-cells in the particular flower of which he speaks are so placed as to be out of reach of the ordinary bee, and have by Natural Selection become specially suited to the taste and habits of night-feeding insects. If this were so, their pale cream-colour would render them more conspicuous at night than the darker-hued blossoms, causing them to be more frequently visited, and therefore fertilised by moths and other night-flyers. Although *M. stellatarum* is a day-flying species, it perhaps still retains the same tastes as the nocturnal moths. Also, it would doubtless find the nectaries in a moth-fertilised flower in a position better suited to the shape of its trunk than in those of any bee-attracting varieties. There are some species of *Viola* which, as Darwin mentions, are dimorphic in their flowering; that is, with some flowers devoting all their efforts to attract insects, so as to secure the advantages of crossing; while others, by growing entirely self-fertilising, prevent the species from becoming extinct, in the event of an absence of bees and other honey-feeders. Is it not possible that the bright colours of some of the species of *Viola* have at a former time been evolved for the purpose of alluring insects, but that these agents, having from some cause or other become scarce, have compelled the plants to make themselves independent of outside help, by becoming self-fertilisers? Then, although the nectarial glands, through their causing a waste of energy, may have gradually diminished, the colours of the petals—by not exerting an influence, either for good or bad, over the welfare of the plants—may have been allowed to remain in their old conditions. I should like to know if Mr. Shaw's plants differed in any marked degree in the internal structures of their flowers, and if all or any part of them were visited by other insects.—ALFRED J. JOHNSON; Boldmere, January, 1894.

GLYPHISIA CRENATA.—In your notice of the Burney sale, you mention that two examples of this rare species only brought 8*s*. and 15*s*.

respectively. This price must have been either a good deal too little or a great deal too much, probably the latter. Most of your old readers are doubtless aware that but three captures of this species have been recorded. The first, an imago, was discovered by my good friend the late Mr. Henry Doubleday, at Ongar Park wood, in June, 1839; and another was taken in the same locality in June, 1841 (see Humphreys and Westwood, vol. i. p. 73). It then disappeared for nearly twelve years, when a solitary larva was beaten from poplar at Halton, Bucks, and was duly recorded ('Zoologist,' 4336) in the autumn of 1853, and again in the spring of 1854, thus:—"Note on *Gluphisia crenata*.—The larva taken by me at Halton, on poplar, on the 18th of August, 1853, and supposed to be *G. crenata*, produced that insect on the 4th of March, 1854, and which was exhibited by Mr. Douglas at the April meeting of the Entomological Society.—(Signed) Joseph Greene; 49, Stephen's Green, Dublin, April 15th, 1854" ('Zoologist,' 4336). That was forty years ago, since which date there does not appear to be any notice of further captures. Here we have an indigenous British insect, the origin of which nobody doubts, which has, apparently, two broods a year, which in all likelihood might be bred as freely as the rest of its family, if the chance occurred, whose larva is most conspicuous, and whose food is found all over the country, which has escaped the vigilance of the collecting fraternity up to date. Still we all know that insects do "disappear" (what a capital word to express our own ignorance!). Just to give a few examples:—There was *Sesia chrysidiformis*, of which Francillon, in days long gone by, took a single specimen, which remained undetected till Brewer found it, and "consigned it to the undignified depths of his 'bacca-box"; and yet this pretty little clearwing had been flitting about the Folkestone Warren in comparative abundance, for years and years, quite unnoticed and unmolested. Then there was *Clostera anachoreta*, discovered in the neighbourhood of Salisbury by Mr. Spratt, who took two specimens some forty years before Mr. Sidney Cooper beat a couple of larvæ from sallow at Saltwood, Kent (beating may be an unscientific, happy-go-lucky method of collecting, but still it is very useful). Then, again, *Dianthœcia albimacula*, discovered by Mr. Bydden sitting on a post near Birchwood, Kent, remained unique for goodness knows how long, chiefly because collectors, perhaps misled by Boisduval, did not know the time of year to look for it, or the way to go to work. The case of *Erastria venustula*—which "disappeared" at first for forty years, and afterwards for fifteen more, owing to our ignorance of its habits—is too well known to require repetition. Numerous other instances might be quoted, but I have already occupied too much of your valuable space. I will, however, just add that in my opinion there is no earthly reason why the lost *Glyphisia* should not again be found, if sought for carefully, perseveringly, and intelligently.—H. Guard Knaggs; Folkestone, January, 1894.

Cerostoma costella and C. radiatella.—This season I have had a large experience with the former, and found it most abundant, almost exclusively among nut: I swept some hundreds of grand forms off the dead twigs. If anyone wants specimens, I have them. Of *C. radiatella* I only took very few, not over half-a-dozen. There was only one oak tree. Some years ago I bred a large number of them from larvæ beaten off oak at Arnside: there were no other trees. This year I got a few when beating *Argyresthia aurulentella* from juniper. There was almost a gale blowing, which frequently overturned my umbrella; still I boxed 120 fine *A. aurulentella* in an hour. I noticed that as soon as in my umbrella, they instinctively tried to get back to the juniper.—J. B. Hodgkinson; Preston, Dec. 10th, 1893.

Nemophora pilella.—I have been reading over the account of my discovery of this neat "long-horn" in Ent. Mo. Mag., but I do not see any mention of my finding larvæ, which no doubt were those of *N. pilella*, when beating *Vaccinium* for larvæ of *Hypsipetes elutata*. I put all the rubbish into a large flower-pot in the garden. During the autumn several larvæ, with their funny bug-like cases, crawled up and attached themselves to the side of the pot, where they remained until spring. I paid no further attention to them, not thinking at the time of the habits of the *Adela* group.—J. B. Hodgkinson; Dec. 10th, 1893.

Lycæna acis in Suffolk.—I forget whether I have previously recorded the capture of this species in Suffolk. In 1861, Mr. Garratt Garratt of Ipswich, took a fine male specimen of *L. acis*, flying in company with *L. ægon*. He thought it looked different, so sent it to me, together with a gynandrous example of *L. ægon*. I returned the example of *L. acis*, and told him to look out for more; but although he captured a good number of *L. ægon* he failed to secure another specimen of *L. acis*. Probably, however, the head-quarters of the latter species were not far off. This season odd examples of *L. astrarche* var. *salmacis* were observed among *L. ægon* flying on the mosses; but as the food-plant of the former grew a considerable distance away, it is probable that the insect had resorted to the wet mosses as a change from the hot limestone of its proper home.—J. B. Hodgkinson. [" Very rare. Foxhall Heath, one specimen, June 24th, 1861, *G. G.*"—Rev. E. N. Bloomfield's 'Lepidoptera of Suffolk,' p. 7.]

Biston hirtaria and Cleora viduaria in Scotland.—Turner, a noted collector, especially of beetles, told me, when he was visiting Preston on his way to Scotland to look after *Asteroscopus nubeculosa*, that he had bred a specimen of *C. viduaria* from a pupa he found near Kinloch, Rannoch; also *B. hirtaria*. I questioned him very closely, and suggested that probably he had found the pupa of *C. viduaria* in the New Forest, and taken it with him to Rannoch. He declared most emphatically that he had not taken any pupæ with him. He knew *C. viduaria* well, in fact anything that would sell; and as far as I knew he was to be trusted. Some one may say it might be *cinctaria*, which I knew E. C. Buxton took freely in Scotland. I called Turner's attention to this; but he adhered to what he had told me.—J. B. Hodgkinson; Preston.

A Butterfly without a Price.—"In their quest of new species of butterflies, enthusiastic collectors are willing to face the fevers of the swamps, the attacks of wild men of the jungles, and look upon thirst, hunger, and tropical heat as inconsiderable trifles. The finest collection in the world—not excepting that in the British Museum—is that of Mr. Berthold Neumoegen, of New York, who has spent a fortune in his search for rare specimens. Butterflies have the same market quotations as rare stamps. Professional dealers issue catalogues, in which one finds the names, with prices affixed. These prices vary from a few pence to £25. But fine 'types,' beautiful and rare 'varieties,' and 'uniques,' are practically priceless. For example, one of the gems of the Neumoegen collection is the wonderful *Papilio neumoegeni*. This insect, the only one of its kind ever captured, was taken in the Island of Sumbawa, south-east of Java. Received in a shipment from his collector, Mr. Neumoegen at once concluded that it was new to science. He sent it to Europe, risking its loss, and experts there decided that he was right. Honrath, the celebrated entomologist, begged the privilege of describing it, and named it in honour of its discoverer. It has figured recently in the annals of the Berlin Entomological Society. It is of a wonderful metallic green. Special expeditions have been sent to the locality several times since, in the hope of finding another, but this one still remains unique. Asked its value, Mr. Neumoegen answered: 'Who can say? It is the only one in the world. Suppose you offer me £50, which I certainly would refuse, I could say to you, "I will give you £100 for its mate," and you could never fill my order. Then it is worth £100, is it not? But it is worth more, for money cannot buy it.' Mr. Neumoegen is a stockbroker on Wall Street." The above appeared in 'To-Day,' Dec. 9th, 1893.—J. Arkle; Chester.

Pupation of Epinephele ianira.—Dr. T. A. Chapman (*ante*, p. 23), remarking upon the probable cause of the bleached patches on the wings of butterflies, states that "*ianira* pupates in a flimsy cocoon low down towards the roots of the grass." This is so contrary to the mode of pupating of this species that I should like to know if Dr. Chapman has ever found pupa of *E. ianira* in a cocoon? The pupa of this butterfly is merely suspended by the anal extremity to a pad of silk spun upon a stem of grass, and is not enclosed in any kind of cocoon whatever.—F. W. Frohawk; 39, Dornton Road, Balham.

Variety of Chrysophanus (Polyommatus) phlœas.—On Sept. 18th, 1893, I captured, at Hereford, a white variety of *Polyommatus phlœas*, All the parts which are usually copper-colour are silvery white, with a very slight tinge of cream at the base of the wings.—H. W. Blathwayt; Frome Bank, Bromyard, Jan. 16th, 1894. [The specimen is referable to the uncommon form of *C. phlœas* var. *schmidtii*, mentioned Entom. xxvi. p. 305.—Ed.]

Acherontia atropos.—With reference to the subject of his note (*ante*, p. 19), Mr. J. B. Williamson will probably be interested to learn that four nearly full-fed larvæ of *A. atropos* were found here between the 9th and 15th of July last, in situations exactly similar to that described by him. Against the front walls, and close beside the doors of three adjoining cottages, in one of the streets, some plants of *Lycium barbarum*, the "tea-tree," are trained, and on these the larvæ were feeding. One larva, which I sent away, was a nice brown variety, resembling in general appearance and pattern that figured in Buckler's 'Larvæ of British Butterflies and Moths,' vol. ii. plate xxi, fig. 1 *a*, but differing from it in that the first few segments showed a delicate pink in place of the white; the body was entirely brown of various shades, with no trace of red in it, and the horn was ivory-coloured instead of brown as in the figure. Of the others, which were typical, one came to an untimely end at the hands of an old woman, the occupant of one of the cottages, who, feeling sure that it *must be* "a locust," flattened it with a brick (!); while from the remaining two the imagines appeared on October 10th and 11th, but unfortunately both of them failed to expand their wings, and resulted in cripples.—Eustace R. Bankes; Corfe Castle, Dorset, Jan. 17th, 1894.

The Burney Collection (Heterocera, continued from p. 25).—One lot of useful Noctuæ, among which were eight examples of *Cymatophora octogesima* (=*ocularis*), was knocked down for 20/–; but for the next lot, which was similar, and contained a specimen of *Bryophila algæ* in addition, the price only rose 4/– higher; and another lot, in which there was also an example of *B. algæ*, but no *C. octogesima*, went for 12/–. Two lots of *Acronycta strigosa* (9) and *A. alni* (8) fetched 30/– and 25/– respectively. There were fourteen examples of *Synia musculosa* and ten of *Leucania vitellina*, and these were offered, at first, in lots comprising two of the former and one of the latter, and sold at 45/– and 42/– per lot; afterwards two specimens of each species were put up in a lot, and realised from 27/6 to 40/– a time. Two examples of *S. musculosa*, with other things, made 20/–. The first of three lots of *L. albipuncta* (4 specimens in each) sold for 32/6, but the other two lots went for 22/– each. Two lots of very useful *Leucania*, each including an example of *L. extranea*, were disposed of at 18/– and 14/–; two other lots, each containing a specimen of *L. l-album*, went for 8/– per lot; another lot, with two *L. l-album*, made 10/–, and a nice parcel of five *L. obsoleta*, six *L. putrescens*, with one *L. l-album*, and others, ran up to 28/–. Lot 380, "*Flammea* 5 fine, *Ulvæ* 6, two var. *bipunctata*, and one var. *nigrostriata*," sold for 30/–, but a similar lot only realised 16/–. Four lots of nice species, including two *Tapinostola concolor* in each, were disposed of at 10/– a time for the first three lots, but the fourth dropped to 8/–; and a lot of *T. hellmanni*, *N. neurica*, &c., with an example of *concolor*, made 10/–. *Nonagria brevilinea* were put up three or four at a time, with short series of other decent species, and were purchased at 11/– 15/– and 26/– per lot. *N. sparganii* realised 5/– and 6/– apiece. There were seventeen specimens of *Xylomiges conspicillaris*, and these were offered five and six in a lot with other desirable species, the prices obtained being equal to about 3/6 per specimen for the *conspicillaris*. *Laphygma exigua*, of which there were ten examples in the collection, ranged in price from 3/6 to 17/6. *Pachetra leucophæa* did not meet with much support, the eighteen specimens offered failing to find customers at anything over 3/– each, and some of them went for much less. The type of *guenéei*, Doubleday (*Luperina testacea* var.), was disposed of for £2 15s., and a cotype was knocked down for £3 15s. An example of *Luperina dumerili*, and one of *Crymodes exulis*, with four specimens each of *Mamestra abjecta* and *L. cespitis*, found a purchaser at 35/–. Two pairs of indifferent *Hydrilla palustris* were sold at 26/–

and 30/- per pair. *Agrotis ashworthii* made from 2/- to 2/6 apiece. *Noctua subrosea* brought out some spirited bidding at first, but this was not maintained throughout; there were six lots, two specimens in each, and the prices realised were £6 6s., £5 5s., £4 10s., £3 5s., £2 5s., and £2, and for one female 12/-. *Noctua sobrina*, with some vars. of *N. castanea*, only fetched about 1/- each, whilst specimens of *Pachnobia hyperborea* (*alpina*) were to be obtained at less than 2/- a time. *Cerastis erythrocephala* found purchasers at 4/- to 10/- each, but *Dasycampa rubiginea*, if allowance be made for other insects in the lots with them, did not average much more than 1/3 per specimen. One lot of *Dianthœcia albimacula*, four *D. cæsia*, and seven *D. irregularis* fetched 21/-; *D. luteago* var. *barretti* (18 specimens), sold at 7/6 and 8/- each, and *Polia xanthomista* var. *nigrocincta* at about 4/-. There were three specimens of *Hadena porphyrea* (*satura*), but these were not much sought after; lot 514, which contained an example of this species, together with *Trigonophora flammea* (=*empyrea*) (5), *H. rectilinea* (6), and others, only realised 6/-, and for a similar lot there was no bid until it was offered with the next, also similar, when the combination was knocked down for 6/-. A specimen of *Hadena peregrina*, "taken by Mr. W. Wigan at sugar, near Lewisham, Aug. 20th, 1868," went for 6/-, as also did another example, "taken at Freshwater, Isle of Wight, 1868," while for a third there was no offer until it was put up with the next lot, which contained still another *peregrina*, and some useful species of *Hadena* (29 specimens), when the entire parcel was disposed of for 10/-; a fifth example of *peregrina*, "taken at Eastbourne, 1870 (received alive)," and nice series of *contigua*, *glauca*, *suasa*, &c., sold for 6/-. *Xylina furcifera* (=*conformis*), of which species there were thirteen specimens, fetched 4/6 to 5/3 each; an example of *Xylina lambda* var. *zinckenii*, "taken by S. Harrington at New Cross, 1866 (vide 'Entomologist,' iii. p. 205, and 'Ent. Annual,' 1867, p. 136)," was sold for 30/-, and an example of the type-form of the same species (*lambda*), "received amongst some common autumnal Noctuæ, collected at Rye in October, 1871," found a purchaser at 32/-. A specimen of *Cucullia artemisia* (*abrotani*), "found with series of *C. absinthii*, and had been overlooked by Mr. Burney," was sold for 40/-. *C. gnaphalii* (12 specimens) realised 8/- to 10/6 each. A lot, including among other things ten specimens each of *Heliothis peltigera* and *H. armigera*, was cleared at 12/-; and a specimen of *Acontia solaris* var. *albicollis*, "taken by Rev. Percy Andrews in a clover-field at Brighton, Aug. 25th, 1859," induced bidding up to 30/-, at which price the hammer fell. *Thalpochares ostrina* did not engage much attention, as two lots each, comprising two examples of this species, with nice series of *Bankia argentata*, *Brephos notha*, and others, only fetched 6/- and 5/-. A specimen of *T. paula*, "taken by Mr. J. Moore at Freshwater, Isle of Wight, June, 1872," was sold for 10/-; whilst two other examples of this species, with good series of *Hydrelia uncula* (=*unca*), *B. notha*, &c., realised only 5/-. *Ophiodes lunaris* was another insect that buyers did not seem to be particularly "gone on"; one lot, containing an example of this species, four *Toxacampa craccæ*, and other species, sold for 6/-, and a similar lot for 8/-. Two lots of *Madopa salicalis* (5), and other useful Deltoids, went for 10/- a lot, and the bidding for eight *Aventia flexula*, one *Zanclognatha emortualis*, and several other good species, only rose to 6/–. Two examples of *Boletobia fuliginaria*, included in lot 220, only fetched 6/–; whereas lot 221, in which were two other specimens, made 22/–. The fourth and concluding section of this Report, dealing with the Geometræ and Pyralides, will appear in the March 'Entomologist.'—Richard South; 12, Abbey Gardens, St. John's Wood, N.W.

Autumnal Emergence and Variation of Argynnis paphia.—During the past autumn I succeeded in rearing a second emergence of *A. paphia* (Entom. xxvi. p. 320). When I exhibited the specimens at a recent meeting of the South London Entomological and Natural History Society, Mr. Tutt stated that he had lately seen examples of a second brood of *A. paphia* in the collection of Mr. J. A. Clark, who had obtained them from the New Forest during the autumn. Again, at a meeting of the above-named Society held on Oct. 12th last, Mr. J. H. Carpenter exhibited a very fine series of white-spotted forms of *A. paphia*, numbering some three dozen specimens; Mr. Tutt then alluded to Mr. Clark's "remarkably fine series" of white-spotted forms, stating that many of them had patches of the green colouring of the var. *valesina* represented in *both* sexes. As I had never observed any trace of the green hue of *valesina* in the white-spotted males, although frequent in the white-spotted females, and as I was not aware of a second brood of *A. paphia* having occurred in a state of nature, I thought it desirable to communicate with Mr. Clark on the subject. In his reply to me that gentleman writes, "My specimens are *not* the second brood; they were taken in the months of June and July." As he kindly invited me to examine the white-spotted forms in his collection referred to by Mr. Tutt, I recently availed myself of the opportunity, accompanied by Mr. Carpenter. We were somewhat surprised to find that the "remarkably fine series" in question consisted of only eight specimens, six males and two females, and upon careful examination we were quite unable to detect the slightest trace of any green colouring in any of the males, although it was present in both the females. In the December No. of the 'Record' (vol. iv. p. 331) Mr. Tutt, in his notes upon *A. paphia*, says, "However, a most remarkable series of such specimens was this year got together by Mr. J. A. Clark." . . . "This year Mr. Clark has a number of specimens in which these pale spots are very conspicuous, but the most interesting point in connection with these is that some of the specimens have a large area round these spots distinctly of the *valesina* colour, shading off into the normal coloration round the outer margin of the wing. Still more strange is the fact that this is *not entirely confined to the female specimens*, *valesina* being distinctly a female aberration." (The italics are mine.) What is Mr. Tutt's reason for making such erroneous assertions, both as regards the second broods and the variation in colour, for which he has apparently no foundation? So far as can be ascertained, no sign of a second emergence of *A. paphia* has occurred in the New Forest during the past autumn.—F. W. Frohawk; January, 1894.

CAPTURES AND FIELD REPORTS.

COLIAS HYALE IN DORSET.—With reference to Mr. Bankes's remarks (Entom. 32), it may be of interest to note that I captured, during the great *C. edusa* emergence of 1877, two specimens of *C. hyale* at Upway, a village midway between Dorchester and Weymouth. They were flying over a red clover field in company with swarms of *C. edusa*, and were easily picked out. During a residence at Upway, from 1875 to 1881, these were the only *C. hyale* I ever came across, and this fact appears to confirm Mr. Bankes's statement that *C. hyale* seldom ranges so far west. I had previously taken three *C. hyale* in Oxfordshire in 1867; one more I obtained in Berkshire in 1892. The six specimens are in my collection, and constitute my series.—J. CLARKE; Reading, January 2nd, 1894.

COLIAS EDUSA IN 1893.—My only experience with this insect, this season, has been one specimen (seen but not captured) a few miles north of Christchurch, Hants, on Aug. 26th; and two specimens, both males, between Hartland and Clovelly, N. Devon, on Sept. 30th. There was a somewhat violent wind prevailing on the latter date, and I was enabled to take up one of these *C. edusa* between the finger and thumb, from off the head of *Scabiosa succisa*, on which it was feeding. I can testify to the scarcity of this butterfly in Surrey, at all events in the Dorking neighbourhood, this year, as I gave special attention to clover fields, and other likely places about here, during the end of July and first three weeks of August, without seeing a single specimen.—R. M. PRIDEAUX; Ashtead, Surrey, December 28th, 1893.

LEPIDOPTERA IN THE NEIGHBOURHOOD OF YORK, 1893.—The season which is now rapidly drawing to a close, and which will long be remembered meteorologically, on account of the marvellous weather experienced, has not been equally memorable for quantity or quality of Lepidoptera noticed. Many generally common insects have been either very rare or else entirely absent. The only species which have been more than usually common at York this season are the following:—*Pieris brassicæ, P. rapæ, Vanessa urticæ, V. atalanta, Acherontia atropos, Sphinx convolvuli, Macroglossa stellatarum, Orthosia suspecta, Anchocelis litura, Phlogophora meticulosa, Hadena protea, Asthena sylvata, Venusia cambricaria, Lobophora lobulata, Collix sparsata, H.* [*? Lomaspilis*] *marginata, Thera variata, Diurnea fagella*; whilst of those which have not occurred in anything like their usual numbers, the following, amongst many others, may be quoted:—*Zygæna loniceræ, Lithosia mesomella, Spilosoma lubricipeda, Acronycta leporina, Noctua festiva, N. rubi, Agrotis porphyrea, Tæniocampa populeti, T. leucographa, Epione vespertaria, Aspilates strigillaria, Eupithecia satyrata, Acidalia immutata, Hypsipetes elutata, Phibalapteryx lignata*, &c. Of those species which have entirely failed to put in an appearance, and which we generally take each season in some numbers, are *Nudaria senex, Hydrelia unca, Plusia festucæ*, and *Miana arcuosa*. My first outing took place on Feb. 14th, in quest of var. *fuscata* of *H. marginaria*, of which I took six; my last on Nov. 3rd, when sugar produced but a few *S. satellitia* and *C. vaccinii*. *H. aurantiaria, H. defoliaria, C. boreata*, and *C. brumata* were very scarce, whilst *O. dilutaria* and *H. pennaria* were not seen. I have noticed the gradual diminution in point of numbers of these species for the past ten years; each year they become scarcer in this neighbourhood, why I know not.

My worst outing produced five moths, my best 253; altogether this season I have set considerably more than 3000 specimens.—W. HEWETT; Howard Street, York, November 11th, 1893.

NOTES FROM READING.—On May 3rd, 1893, I took *Agrotis cinerea*, and on Aug. 4th *Charæas graminis*, both at light — the first time I have taken either species in this district. On May 29th *Dipterygia scabriuscula* (*pinastri*); and a second brood, I suppose, on Aug. 9th; I have never seen a second brood before. On Sept. 27th *Xylina semibrunnea*, at sugar; and on the 29th twenty-five specimens of *Ocnomera femorata*, also at sugar. On Jan. 13th of the present year I took *Hybernia rupicapraria*, and on the 21st *Phigalia pedaria* (*pilosaria*), also *Hybernia leucophæaria*. Is not this very early for the latter species?—W. E. BUTLER; Hayling House, Reading, Jan. 22nd, 1894.

NOTES FROM GOSPORT.—In this district *Colias edusa* has occurred very sparingly this year, about half-a-dozen specimens only having been seen. I took a fine male on Sept. 3rd in my garden, and that represented the sum total of my captures. *Vanessa cardui* also has been very scarce. Treacle was nearly useless during the spring months, but insects came freely to it during the autumn, good captures being made.—W. H. MACKETT; Science and Art School, Gosport, December, 1893.

EARLY OCCURRENCE OF PHIGALIA PEDARIA (PILOSARIA). — On Jan. 20th I captured two good specimens of this insect on a fence in Epping Forest. This is the earliest I have ever found it, hitherto dates in February having been the rule.—F. W. FREIR; Elm House, Walthamstow.

HYBERNIA DEFOLIARIA IN JANUARY.—I took this insect on the 20th of this month in Epping Forest, but was rather puzzled to account for it. In a previous volume of the 'Entomologist' I notice records of its appearance in February, 1890. The specimen I caught was the dotted variety figured by Newman, and was in good condition.—F. W. FREIR; Jan. 22nd, 1894.

CHŒROCAMPA CELERIO IN SUSSEX.—The occurrence of this fine hawk-moth at Littlehampton is worth noting. Staying there recently I made the acquaintance of Master Herbert Percy Gibbons, at Surrey House. Master Herbert is quite an ardent young collector; he showed me his boxes, and was quite proud of his "yellows," "humming-birds," "privets," &c.; one of the latter, by-the-bye, was really a fine example of *Sphinx convolvuli*; but I soon noticed rather a dilapidated specimen in a corner of the box; it was *C. celerio*, and was given to him by the gardener at Surrey House, who caught it "at rest" the summer before last. I told Master Percy what a prize it was. It is now being relaxed prior to re-setting, and with a little "doing-up" it will make a very fair specimen. This is the second I have in my cabinet.—CLARENCE E. FRY; Watford, Herts, January, 1894.

ABUNDANCE OF WASPS.—*Vespa germanica*, *V. vulgaris*, and *V. norvegica*, the three commonest species in this district, were exceptionally common in Cheshire and North Wales last year; the two former absolutely swarmed.—R. NEWSTEAD (Curator); Museum, Chester, Jan. 2nd, 1894.

HYBERNIA LEUCOPHÆARIA, &c.— Miss Maude Alderson states that *H. leucophæaria* was well out on Jan. 17th, at Worksop, Notts. Mr. D. P. Turner writes from Tonbridge, Jan. 13th, "The weather is unusually mild just now. Although not directly connected with Entomology, it may be of interest to record that I saw a bat flying about at dusk on the 11th of this month; it must have been perplexed at the absence of its usual food." Some time during the week ending Jan. 20th a bat was captured, by Mr. D. Cross, in a house near Marlborough Road Station, St. John's Wood. —Ed.

SOCIETIES.

Entomological Society of London.—*December 6th*, 1893.—Henry John Elwes, Esq., F.L.S., President, in the chair. Mr. W. F. Kirby exhibited, for Dr. Livett, a series of specimens of a moth taken at Wells, which Dr. Livett considered to be varieties of *Dasycampa rubiginea*, but which many entomologists present thought were varieties of *Cerastis vaccinii*.* Mr. Kirby added that specimens similar in appearance to those exhibited had been taken rather freely during the past autumn in Berkshire, and it was suggested that they might be hybrids between *D. rubiginea* and *C. vaccinii*. Mr. Lovell Keays exhibited, for Mr. A. L. Keays, a series of *Lycæna alexis*, with confluent spots on the under sides of the front wings. He drew attention to the fact that the insects were all taken within a short radius, and probably were in the ratio of about one in forty with reference to the ordinary form. All the examples, with one exception, were females. Mr. Lovell Keays remarked that he had some years ago met with a similar brood near Weymouth, in which the confluent spots were, as far as the specimens collected by him extended, entirely confined to females, and in that instance the proportion was much higher. Prof. S. H. Scudder, of Cambridge, Mass., U.S.A., stated that he had observed the occurrence of broods of *Chrysophanus phlæas* with suffused spots in America, but they were not confined to any special locality. Mr. C. O. Waterhouse exhibited the type-specimen of *Coptomia opalina* of Gory, from the Hope Collection at Oxford, and pointed out that it was quite distinct from *C. mutabilis*, W. The distinct punctuation of the whole insect, and the striolate pygidium in *C. opalina*, were sufficient to distinguish it at once. Mr. Waterhouse called attention to this, as some French entomologists maintain that these insects are the same species. He also called attention to *Silpha atomaria*, of Linnæus (Syst. Nat., ed. xii., i., p. 574), a Swedish species which appeared to have escaped notice, and was not included in any catalogue. The type is still extant in the Linnean cabinet, and Mr. Waterhouse said he was of opinion that it is *Olibrus geminus* of our collections, but he had not had an opportunity of making a critical examination. He also exhibited male and female specimens of a *Helopeltis* (the Tea-Bug), which he considered a distinct species, and stated that it had occurred only in Assam. Mr. M. Jacoby exhibited certain species and varieties of the genus *Ceroglossus* from Chili, and Dr. D. Sharp, Mr. J. J. Walker, and Mr. Champion made remarks on their geographical distribution. Prof. Scudder exhibited the type-specimen of a fossil butterfly—*Prodryas persephone*—found in beds of Tertiary Age at Florissant, Colorado. He said the species belonged to the *Nymphalidæ*, and the specimen was remarkable as being in more perfect condition than any fossil butterfly from the European Tertiaries. He also stated that he had found a bed near the White River on the borders of Utah, in which insects were even more abundant than in the Florissant beds. Dr. Sharp, Mr. Kirby, Mr. H. Goss, and the President took part in the discussion which ensued. Mr. Goss exhibited hybernating larvæ of *Spilothyrus alceæ*, which had been sent to him by Mr. F. Bromilow from St. Maurice, Nice. Mr. W. F. H. Blandford read a paper entitled "The Rhynchophorous Coleoptera of Japan. Part III. Scolytidæ." The President, Dr. Sharp, Mr. Champion, Mr. McLachlan, and Mr. J. J. Walker took part in the discussion which ensued concerning the distribution of the group and the admixture of Palæarctic and Oriental forms in Japan. Mr. G. T. Bethune-Baker read a paper entitled "Notes on some Lepidoptera received from the neighbourhood of Alexandria," and exhibited the specimens. Mr. McLachlan suggested that the scarcity of insects in Lower Egypt was possibly to be accounted for by the fact that much of the country was under water for a portion of the year; and Dr. Sharp said that another cause of the scarcity was the cultivation of every available piece of land for centuries past. The President and Mr. J. J. Walker continued the discussion. Mr. C. O. Waterhouse read a paper entitled "Further observations on the Tea-Bugs (*Helopeltis*) of India." Dr. F. A. Dixey communicated a paper entitled "On the Phylogeny of the *Pierinæ*, as illustrated by their Wing-markings and Geographical Distribution."—H. Goss and W. W. Fowler, *Hon. Secs.*

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* See note, *ante*, p. 61.

January 17*th*, 1894.—*The* 61*st* *Annual Meeting*.—Mr. Frederic Merrifield, Vice-President, in the chair. An abstract of the Treasurer's accounts, showing a balance in the Society's favour, having been read by Mr. J. Jenner Weir, one of the Auditors, the Secretary, Mr. H. Goss, read the Report of the Council. It was then announced that the following gentlemen had been elected as Officers and Council for 1894:—President, Mr. Henry J. Elwes, F.L.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss, F.L.S., and the Rev. Canon Fowler, M.A., F.L.S.; Librarian, Mr. George C. Champion, F.Z.S.; and as other Members of the Council, Mr. Walter F. H. Blandford, M.A., F.Z.S., Mr. Charles J. Gahan, M.A., Mr. Frederic Merrifield, Prof. Edward B. Poulton, M.A., F.R.S., Colonel Charles Swinhoe, M.A., F.L.S., Mr. George H. Verrall, Mr. James J. Walker, R.N., F.L.S., and the Right Hon. Lord Walsingham, LL.D., F.R.S. Mr. Merrifield then read the President's Address, in which, after alluding to the principal events of the past year, and the prosperous condition of the Society, he referred to the additions which had been made in 1893 to the literature of Entomology, calling attention to the 'Butterflies of China and Japan,' by Mr. J. H. Leech; the 'Moths of India,' by Mr. G. F. Hampson; the 'Butterflies of North America,' by Mr. W. H. Edwards; 'Lepidoptera Indica,' by Dr. F. Moore; and the continuation of the 'Biologia Centrali-Americana,' by Messrs. F. D. Godman, F.R.S., and Osbert Salvin, F.R.S. He also commented on the recent publications of the Grand Duke Nicholas Mikhailovitch, Mons. Charles Oberthür, and Dr. Staudinger, on the Continent. The President concluded by referring to the losses by death during the year of several Fellows of the Society and other Entomologists, special mention being made of Prof. H. A. Hagen, M.D., the Rev. Leonard Blomefield, M.A., Mr. A. C. Horner, M.R.C.S., Prof. J. Wood-Mason, the Rev. Henry Burney, M.A., Mr. J. C. Bowring, F.L.S., the Rev. F. O. Morris, B.A., Mr. J. Batty, Mr. Francis P. Pascoe, F.L.S., Herr Eduard Honrath, and Dr. Adolph Speyer. A vote of thanks to the President for his Address was proposed by Colonel Swinhoe, seconded by Mr. Jenner Weir, and carried unanimously. Mr. Merrifield replied for the President. Lord Walsingham proposed a vote of thanks to the Officers of the Society; this was seconded by Mr. Waterhouse, and carried unanimously. Mr. McLachlan and Mr. Goss replied, and the proceedings terminated.—H. Goss, *Hon. Sec.*

South London Entomological and Natural History Society.—*November* 23*rd*, 1893.—J. Jenner Weir, Esq., F.E.S., President, in the chair. Mr. Carpenter exhibited captured specimens of *Argynnis paphia*, from the New Forest, one male and one female having a portion of the right primary in each with a whitish ground; also a non-metallic intermediate var. *valesina*. Mr. Frohawk, specimens of *A. paphia* and var. *valesina* which had emerged on Nov. 20th and 21st, having been kept at the ordinary temperature. He also reported having bred *Vanessa atalanta* this month, and that the *Apatura iris* of Mr. Watson had emerged, but was a cripple. A long discussion ensued regarding the second broods of the Argynnidæ, the metamorphoses, which usually take eight or nine months, being in these cases completed in as many weeks, the general opinion being, however, that temperature by itself had very little influence. Mr. Sauzé, types of Coleoptera taken by himself this year. Mr. Weir, *Lycæna trochilus* from the South African Republic, sent by Dr. Rendall, *Lycæna exilis* taken at Las Cruces by Prof. Cockerell, and our British *Lycæna minima* for comparison. He remarked on the undesirability of giving comparative names, the two former species measuring 15 mm. in expanse of wings, while the latter varied from 17 mm. to 22 mm. Mr. Adkin, two specimens of *Chrysophanus* (*Polyommatus*) *phlæas;* in one the copper band of the hind wings was all but obliterated, and in the other represented by narrow streaks on the wing rays.

December 14*th*.—The President in the chair. Mr. South exhibited continental specimens of *Argynnis adippe* var. *cleodoxa* and var. *chlorodippe*, both from South Europe; a variety of *Thecla rubi*, from Ireland, the upper side of which was very dark, while there was no green on the under side, yet the white spots were strongly developed; also *Syrichthus malvæ* var. *tarus*, from Devon, where it was stated to be not uncommon. Mr. Pearce, a long series of *Chrysophanus hypophlæas*, series of *Colias philodice* with pale var. of the female, *Terias nicippe* with yellow form of male, *Pieris rapæ*, and various species of Lycænidæ, all from Alleghany Co., U.S.A.; also *Nathalis iole* from Colorado. A discussion ensued as to whether *C. hypophlæas* should be considered a species. Mr. Weir, *Planema euryta*, an Acræine butterfly in which the sexes differed materially in colour and still more in shape, yet in each of these respects it was mimicked by the corresponding sexes of *Pseudacræa nirce*, a Nymphaline species, all from the Cameroons. Mr. Turner, a long bred series of *Thera juniperata*, arranged to show the varied interruption of the band across the fore wings. Mr. Billups, the rare Dipteron, *Diastata basilis*, from Bromley, Kent, and hitherto unrecorded as British; also the following species of Ichneumonidæ bred by the members:—*Ichneumon fuscipes*, bred from larvæ of *Acronycta myricæ*, by Mr. Short; *Rhizarcha æreolaris*, from the dipterous larvæ of *Phytomyza aquilegiæ*, by himself; *Colas dispar*, from larvæ of *Melitæa aurinia*, by Mr. Frohawk; *Ichneumon pyrrhopus*, from *Eupithecia helveticaria; Glypta bicernis*, from *Tortrix palleana; Anomalon cerinops*, from *Heliothis dipsacea;* and *Lissonota sulphurifera*, from *Sesia scoliiformis;* all bred by Mr. Adkin. Mr. Adkin, a varied series of *Tæniocampa gothica* from Rannoch, also yellow varieties of *Zygæna trifolii* from W. Sussex.

January 11*th*, 1894.—The President in the chair.—Mr. Adkin exhibited several series of *Thera juniperata*, L., from various Scotch localities, contrasting them with those exhibited, at the meeting previous, from Purley. Mr. Oldham, varied series of *Hybernia defoliaria*, L.; *H. aurantiaria*, Esp., from Epping Forest; and a specimen of the local *Libellula quadrimaculata*, L., from Cambridgeshire. Mr. South, some remarkable vars. of *Cerastis vaccinii*, L., taken in Kent and Surrey, with British and Continental specimens and varieties of *C. ligula*, Esp. (*spadicea*), and a specimen of *Acronycta aceris* var. *infuscata*, Haw. Mr. W. A. Pearce some very beautiful Rhopalocera from Alleghany, U.S.A., taken in 1893., viz., *Papilio asterias*, Fab., *P. turnus*, L., *P. philenor*, L., *P. troilus*, L., *Limenitis dissippus*, Gdt., *L. ursula*, Fab., and *Apatura elyton*, Bd. Mr. Weir mentioned that the female of *P. turnus* was dimorphic, and that *L. dissippus* was the mimic of *Anosia plexippus*. Mr. Auld, *Vanessa io*, which had been cleaned by Dr. Knaggs with methylated ether, and which had regained its pristine appearance. Mr. Tugwell sent for exhibition a long series of *Spilosoma lubricipeda*, Esp., and its various varieties and local races, especially of var. *radiata*, Haw., = *zatima*, Cr., and communicated notes, in which he described the York city form as var. *fasciata*. He had also sent for exhibition a pair of *Plusia moneta*, Fab., bred by Mr. Matthews; two varieties of *Arctia villica*, L., from Harwich; three dark Irish forms of *Agrotis lucernea*, L.; a long series of *Liparis monacha*, L., from New Forest ova, some of which were very dark; six of the dark Sheffield form of *Boarmia repandata*, L.; vars. of *Lycæna ægon*, Schiff., from Westmoreland; four *Dicranura bicuspis*, Bork., from Tilgate; a series of *Callimorpha hera*, L., bred from Starcross ova; a pair of *Pachetra leucophæa*, View., taken by Mr. Hanbury on the North Downs; several *Noctua conflua* from Shetland; six of the remarkable dark Irish form of *Camptogramma bilineata*, L., and a series of *Notodonta dromedarius*, L.—Hy. J. Turner (Hon. Report Sec.).

Lancashire and Cheshire Entomological Society.—*Dec.* 11*th*, 1893. The monthly meeting was held in the Free Library, Mr. S. J. Capper, F.L.S., F.E.S., President, in the chair. Mr. C. H. Schill, of Manchester, gave "A few introductory remarks on the genus *Vanessa* and its allies," and showed the ease with which exotics could now be obtained from friends residing abroad. He stated that it was almost necessary to work single groups and become specialists thereon, rather than attempt to form gigantic collections of whole orders, of which it was almost impossible to obtain a complete knowledge. He then described the chief points of difference for separating the genera and species, illustrating his remarks by a number of closely connected species of the genus. Mr. C. G. Barrett, of London, explained and discussed Mr. Merrifield's recent experiments on the effect of temperature on the genus *Vanessa*. Mr. C. E. Stott read a few remarks upon *Ammophila lutaria*, Fab., and showed a specimen captured near Blackpool in July, 1892. Mr. Harker exhibited living specimens of a *Corynetes* feeding in Copra from Singapore, and *Sesia scoliiformis* from the North of Scotland. Mr. Newstead, a nest of *Vespa vulgaris*, from Malpas, Cheshire, which was built to a rafter inside an outhouse, a most unusual position; and *Sphæroden cylindricum* and larvæ from a pear tree near Chester. Mr. Herbert Stott, a remarkable variety of *Celæna haworthii* from Bolton, 1893. Mr. Gregson, a specimen of *Heliothis peltigera* captured at Wallasey in 1887. Mr. Watson, a number of *Parnassius apollo* from various localities, also *P. hardwickii* from N.W. Himalaya, *P. jacquemontii* from the same locality, *P. glacialis* from Yokohama, *P. smintheus* from Colorado, *P. phœbus* (Fab.) = *delius* (Esp.) from Helvetia, showing female pouch, and *Enycus cressida* from Queensland, also showing the female pouch.

Annual Meeting.—The Annual Meeting was held on Monday, Jan. 8th, 1894, in the classroom of the Free Public Library (William Brown Street), Mr. S. J. Capper, President, in the chair. The following officers were appointed:—President, Mr. S. J. Capper; Vice-President, Dr. J. W. Ellis; Secretary, Mr. F. N. Pierce; Treasurer, Mr. C. E. Stott; and Librarian, Mr. H. Lock. The President, in the course of a short address, thanked the members for the honour they had bestowed upon him in re-electing him as President. This was the seventeenth time he had acted in such a capacity. He congratulated the Society on its continued success. They were now entering on their seventeenth year, and it was most gratifying to state that they had never been in a more prosperous condition than at present. The sudden death, a few months ago, of the Rev. H. H. Higgins deprived them of one of their most prominent members. They always welcomed his kind face among them at their gatherings, and listened with attention to his ever pertinent remarks. In the Rev. H. H. Higgins they had lost a member whom it was impossible to replace, and few men were such lovers of natural history as was their late friend. The retiring Vice-President, Mr. W. E. Sharp, delivered the annual address, the subject of which was "The New Entomology." The author, after briefly sketching the origin and historical development of Entomology, drew attention to the manner in which that study had been influenced by the modern methods of scientific enquiry, and showed how great a revolution had been effected in the estimation of nature by the general acceptance of the theory of evolution, and how wider, fuller, and more important the study of the order Insecta had become since it had been treated as part of the great science of Biology, and appreciated the fact that Entomology meant something more than merely the collection and systematic arrangement of insects. In the course of the evening a number of exhibits were displayed.—F. N. Pierce, *Hon. Sec.*

Birmingham Entomological Society.—*November* 20*th*, 1893.—Mr. R. C. Bradley in the chair. Exhibits:—By Mr. E. C. Rossiter, insects from Arley, including *Aplecta tincta*, *Hadena contigua* and *H. proteus*; also one specimen of *Xylophasia scolopacina* from Shut Mill. By Mr. A. H. Martineau, *Macroglossa stellatarum* from Solihull and Abersoch in North Wales, and one specimen of *Sesia cynipiformis* from Wyre Forest; also male specimens of three species of bees from Nevin in N. Wales—*Bombus muscorum*, *B. sylvarum*, and *B. cognatus*—all easily distinguished from one another by the arrangement of the hairs, and remarkably alike in appearance. By Mr. R. C. Bradley, males, females, and neuters of *Vespa crabro* from Astwood Bank; also *Ammophila sabulosa* from Cannock Chase, for which species Mr. Saunders, in his 'Hymenoptera Aculeata,' Part iii., gives no midland localities. By Mr. W. Harrison, a nest of *Bombus cognatus*—males, females, and neuters—from Harborne; also a box of Lepidoptera taken during the trips of the Society to the Cotswolds in June last, and including, in addition to species taken by other members, *Nemeobius lucina*, *Euchelia jacobææ*, and *Nemeophila plantaginis*, male and female, &c. Mr. F. W. Urich, of Trinidad, communicated a paper entitled "Wayside Notes of a Naturalist;" it described a walk in the neighbourhood of Port of Spain, with many observations upon the habits of the insects, &c., met with. A number of photographs of the district were shown, also a box of insects which had been collected during one week, to show what might be done there; the box contained about 50 dragonflies, and over 130 Lepidoptera, &c.

December 18*th*.—Mr. G. H. Kenrick, F.E.S., Vice-President, in the chair. Exhibits:—By Mr. R. C. Bradley, *Polyommatus phlœas*, from Sutton and Knowle, a short and very variable series. Mr. G. T. Bethune-Baker referred to Mr. F. Merrifield's breeding experiments with *P. phlœas*, as recently described before the London Entomological Society, and said that Mr. Merrifield found that he got darker and duller colours with heat, and paler and brighter ones with cold; Mr. Bradley, however, had taken his lighter specimens in Sept. and Oct., and they had probably therefore been bred during hot months. Mr. Bradley also showed five species of Diptera, all new to the British list, namely, *Dactylolabis gracilipes*, Lw., *Goniomyia jecunda*, Lw., *Ephelia varinervis*, Ztt., *Clinocera lamellata*, Lw., and *Didea fasciata*, Macq. Mr. G. T. Bethune-Baker, *Crambus furcatellus*, *C. ericellus*, and *Psodos coracina*, all from Rannoch. Mr. G. H. Kenrick, a boxful of insects taken by himself in Sutherlandshire this autumn, and including *Calocampa solidaginis*, *C. vetusta* (common), *C. exoleta*, *Epunda nigra*, *Noctua umbrosa*, *Agrotis suffusa*, &c.; he said that the specimens of *C. solidaginis*, of which he took a nice series, were lighter and greyer than our Cannock ones. Mr. W. Harrison, three boxes of Hymenoptera taken during the year, and including *Andrena trimmerana* from a spot in Edgbaston, where he has seen it for several years; this year, for the first time, he has seen and taken the parasite, *Nomada alternata*, and it was commoner than its host; there were also in the boxes *Halictus smeathmanella*, *Mimesa dahlbomi*, *Crabro unicolor*, *Cœlioxys vectis*, *Osmia bicolor*, &c. Mr. Martineau, a box of Hymenoptera taken this year, including *Crabro interruptus* taken at Middleton Woods, *Mimesa dahlbomi* from

Wyre Forest, and *Agenia variegata* from Selsley, Glos. Mr. Wainwright, three boxes containing his collection of the Syrphidæ. Mr. G. W. Wynn, a box of Lepidoptera taken this year, including *Notodonta chaonia*, *Hadena genistæ*, *Thecla rubi*, and others, from Wyre Forest. Mr. H. J. Sands, some fine specimens of *Vespa crabro*, from Alvechurch, where it has been unusually abundant; also a series of *Demas coryli* from the Chilterns, Oxfordshire, *Botys hyalinalis* from Wyre, &c. Mr. E. C. Rossiter, *Polia chi*, *Melanippe hastata*, *Chærocampa porcellus*, *Aspilates strigillaria*, *Cerigo matura*, &c., all from Wyre Forest; also *Calymnia affinis* from Clent.—Colbran J. Wainwright, *Hon. Sec.*

Nottingham Entomological Society.— A meeting was held on Oct. 16th, when an exhibition of specimens taken this year was given, many excellent specimens being shown by the various members. On Nov. 6th a microscopical evening took place. Mr. Allen and Mr Marshall kindly brought their microscopes, and a very instructive evening was spent. The meetings continue to be held on the first and third Fridays each month, at the Morley House. Local entomologists are cordially invited to attend.—C. Whitehall, *Hon. Sec.*

Streatham Entomological Club. — A meeting of this Club was held at Streatham Hill on January 22nd, C. H. Watson, Esq., in the chair. There was a full attendance of members. There were several interesting exhibits of local and general interest, including fine vars. of *Abraxas grossulariata* by Mr. J. Henderson. Some very instructive remarks were made upon this exhibit by Messrs. F. W. Frohawk and J. H. Carpenter. Other exhibits were *Argynnis aglaia* and *A. adippe*, from the New Forest; also the specimen of a second brood of *Apatura iris* by Mr. C. H. Watson (see *ante*, p. 61). A discussion followed on the local fauna, and Messrs. Mark Winkley and Alex. C. Forrester suggested that it would be desirable for the Streatham Entomological Club to proceed at once with the formation of a reliable local list.—John Henderson, *Hon. Sec.;* 7, Pinfold Road, Streatham, S.W.

York and District Field Naturalists' Society.—The following is a list of the varieties and local forms of Lepidoptera exhibited at the museum, York, by the members of the York Society, during the past season (1893):—By the President (Mr. G. C. Dennis), a living bred specimen of *Spilosoma lubricipeda* var. *radiata* from Barnsley. By Mr. R. Dutton, forms of *Abraxas ulmata* and *S. lubricipeda* (York form); a variety of *A. grossulariata*, York; forms of *Asphalia diluta* and *Hadena protea*, selected from a great number of specimens taken this season at sugar; also a fine bred hermaphrodite specimen of *Epione vespertaria*, from York. By Mr. S. Walker, a number of varieties of *Orthosia suspecta*, taken this season at York; also *Boarmia rhomboidaria* var. *perfumaria*. By Mr. G. Jackson, a large number of exceptionally fine varieties of *S. lubricipeda*, bred from larvæ obtained during the past few seasons in the neighbourhood of York, none of them approaching "à beaucoup près" the var. *radiata;* and Mr. Jackson stated that although he had bred this species largely for a number of years he had never been so successful as to obtain this variety. By Mr. J. Hawkins, *Hybernia progemmaria* var. *fuscata*, York; numerous specimens of *Tephrosia biundularia* var. *delamerensis*, together with intermediate forms, bred this season, from York; and *Zygæna loniceræ* var. *semilutescens*, bred, York. By Mr. W. Hewett, *Acronycta ligustri* var. *olivacea*, Driffield; dark forms of *Luperina testacea*, from Hartlepool and Darlington; varieties of *S. lubricipeda*, from Driffield, Barnsley, Darlington, and York (one from Driffield having the hind wings of the var. *radiata* colour, *i. e.*, smoky black, the base, wing-rays, and fringe alone being cream-coloured; the head and thorax cream-coloured; the body yellow, with six black spots down the middle and on each side; the antennæ simple; the fore wings typical); an exceedingly fine variety of *Arctia caia*, from Hull (this variety has the fore wings of an almost uniform brown colour, the hind wings, with the exception of the base and fringe, being black); forms of *Orthosia pistacina*, selected from numerous examples taken at Hull; variable series of *Tæniocampa gothica*, selected from more than 300 bred specimens, Darlington; dark melanic form of *Smerinthus populi*, of a uniform smoky black, from Beverley; variety of *Vanessa c-album*, having the hind wings of a uniform chocolate colour, Yorks; *H. progemmaria* var. *fuscata*, York; also a long bred series of *T. biundularia* var. *delamerensis*, York; melanic forms of *Diurnea fagella*, Sledmere; a very dark variety of *A. grossulariata*, having the fore wings almost entirely black, from Beverley, and a dark variety from Driffield; long and variable series of *Lomaspilis marginata*, from York; two suffused examples of *Ephyra pendularia*, York; light forms of *A. ulmata* from Sledmere, and black forms from Edlington Wood near Doncaster; also a very light (almost white) specimen of *A. ulmata*, and a peculiar lead-coloured variety of same species from Drewton Dale, Yorkshire, 1893; pale variety of *S. populi*, Hull; two dark forms of *Odontopera bidentata*, Hull; forms of *Anchocelis litura* and *A. pistacina*, from York, Beverley, Pocklington, and Holtby; very dark forms of *Noctua xanthographa*, Yorks; two varieties of *Venusia cambricaria*, from Sledmere; varieties of *O. suspecta*, York; *Z. loniceræ* var. *semilutescens*, York; variable series of *Apamea fibrosa*, from Wicken Fen; a fine variety of *V. urticæ*, bred about the year 1877, Beverley; also some fine dark varieties of *A. grossulariata*, bred this season at York; and two very pale varieties of same species from Yorkshire.—William Hewett, *Hon. Sec.*; December, 1893.

RECENT LITERATURE.

Brief Guide to the Commoner Butterflies of the Northern United States and Canada. By Samuel Hubbard Scudder. New York: Holt & Co. 1893. 12mo, 12 + 206 pp.

The author has in this work carried out an excellent idea of aiding the beginner in the study of the butterflies which he would probably meet with, in the area indicated, during the first year or two of industriously collecting. The description of each species is lucidly given under the three heads of Butterfly, Caterpillar and Chrysalis; then follows an account of the form and structure of the egg, the mode of oviposition, and the food-plant of the larva, together with much interesting matter completing the life-history of the insect.

In order that the tyro entomologist may not in his early career be troubled with too much Latinity, the four families of butterflies are named "Brush-footed Butterflies" = Nymphalidæ, "Gossamer-winged Butterflies" = Lycænidæ, "Typical Butterflies" = Papilionidæ, and "Skippers" = Hesperiidæ, and the subfamilies have also English names. Three keys to the various groups are given, based on the perfect Butterfly, the Caterpillar, and Chrysalis respectively; these are drawn up with great care, and will doubtless be of great use to the student, even though he may have made much progress in his studies.

Mr. Scudder's classification is doubtless that which places the families of butterflies in their proper sequence; and it is much to be regretted that the entomologists who deal with our native species, still persist in interposing the four-legged Nymphalidæ between the two six-legged families, the Papilionidæ and Hesperiidæ: those who wish to be enlightened on this subject cannot do better than read the reasons Mr. Scudder gives for the mode of classification he has adopted.

Those who confine their studies mainly to our British species of Rhopalocera will find valuable life-histories given of *Anosia plexippus*, *Vanessa cardui*, *V. atalanta*, *Euvanessa antiopa*, and of species very closely allied to British, viz., *Aglais milberti*, congeneric with *A. urticæ; Polygonia progne*, *faunus*, *comma*, and *interrogationis*, all four more or less resembling *P. c-album; Cyaniris pseudargiolus*, almost identical with *C. argiolus; Heodes hypophlæas*, little more than a geographical race of the only other species of the genus, our familiar *H. phlæas;* and *Pieris oleracea*, only slightly differentiated from *P. napi; Pieris rapæ* has been introduced from Europe, and is now a very destructive species both in Canada and the United States.

The book is on the whole an excellent introduction to a knowledge of the life-histories of the species treated of, and will be followed by 'A Student's Manual of the Butterflies of North America, North of Mexico,' as announced on the fly-leaf at the beginning.

J. J. W.

Victorian Butterflies, and how to collect them. By Ernest Anderson and Frank Palmer Spry. Part I.; Complete, with Index. 8vo, pp. 80. Melbourne: H. Hearne & Co. 1893.

A well-written little book, including recognisable woodcuts of the Papilionidæ and Nymphalidæ found in Victoria, as well as of their larvæ, so far as known. It will not only be useful in Australia, but also to those who are commencing the study of Exotic Butterflies, by familiarising them with the Australian species, while the attention paid to the larvæ by the authors adds a real scientific value to this unpretentious little work. The second part, including the Lycænidæ and Hesperiidæ, is, we are informed, in progress, and will be issued shortly. We believe that copies may be obtained in London from Mr. J. A. Clark, 48, The Broadway, London Fields, Hackney.

Erratum.—In the Catalogue of Irish Lepidoptera (*ante*, p. 13), at the close of the notice of *Hepialus velleda*, after the words "Co. Sligo, &c.," should be inserted *Hepialus lupulinus*, L.

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THE NEW ENTOMOLOGY.*

BY W. E. SHARP.

NEARLY twenty years have elapsed since the members of this Society were privileged to listen to the first of its President's Addresses. Since that day members have come and gone, the Society has shared in the mutations inevitable in human affairs, and very few of those I see around me to-night were, I think, present on the occasion of that Inaugural Address. But we all know that, year by year, since then we have heard an annual compendium of entomological progress, and an epitome of whatever notable achievements each year has brought.

You will therefore readily appreciate my difficulty in adding to such a series, and I trust extend to me your forbearance in the task laid upon me; for to worthily follow such a part, and tell you, as our President would have done, all that might be worth telling of the result of the labours of the entomological world, now so large and so enterprising, during the year 1893, is, as I am only too conscious, a work beyond my powers.

With your permission, then, I will take a more general survey, and allow myself to dwell this evening on the wider and more abstract subject of the present position of entomological science. And I am the more disposed to bring this matter before you because I think that, to any one at all conversant with the progress of Entomology, it must be apparent that of recent years that study has assumed a wider horizon, and taken to itself new and perhaps even more fascinating methods.

We are all of course aware that Entomology is at best but a partial science, that it is in reality a small fragment of the great Science of Biology. Yet Entomology and Entomologists existed before ever Biology, under that name, was invented; and it is, perhaps, worth while considering how and to what extent the advent of the science has affected and shaped the course of the study.

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* Annual Address delivered before the Entomological Society of Lancashire and Cheshire, January 8th, 1894.

I said there was an Entomology before Biology began to be—that simply means that the observation of a particular part of animated nature necessarily preceded the intellectual comprehension of such observations and their fusion into some ordered theory of life; in other words, we must have the observer before the theorist, the quarryman before the architect, although the theorist and the architect may be the greater. Thus our first Entomologists were simply observers who recorded what they saw without troubling themselves with problems which seemed to them insoluble, or theories which appeared baseless or unnecessary.

Now the beginnings of the systematic observation of Nature are lost in the night of ages. Perhaps, had we that missing work of the great Israelitish Sultan, which—so we are told by the author of 'The New Atlantis'—was preserved among the archives of the city of Bensalem, we might find the first entomological treatise. Solomon certainly appears to have observed to some purpose the laborious commonwealth of the ants, and evidently knew more about Arachne than did Ovid, although the Roman poet supplies us with particulars of her evolution in a more dramatic form. However, as that monarch's detailed notes on Natural History are unfortunately lost beyond hope of recovery, we must turn from the Semite to the Greek, and find in Aristotle the first mind of the ancient days who seemed to consider the natural world at all worth investigation. Nor will I detain you long with the great Stagirite, although few intellects of wider grasp have appeared on the human stage, and although he must ever be the patron saint of all who lean to the scientific method of enquiry into natural phenomena. For Aristotle was the first to demonstrate that Nature was an entity, *in itself* worth investigation,—that, besides art or the apprehension of the beautiful, there was another and a worthier function of the human faculties, science or the apprehension of the true: this was his great service to all time, and not the record of any particular observation or experiments.

From Aristotle to Gesner, the Swiss, seems a far cry, a sweep of some eighteen centuries. Yet in the interval no name stands out conspicuously that of a naturalist. Conrad Gesner was the first whose mind, touched by that rising intellectual tide which we call the Renaissance, took the direction of the study of Nature. The work was carried on by the Dutch Swammerdam, the English Ray, and the great Swede Karl Linné, commonly known as Linnæus. These were the days of the Encyclopædic systematists. A modern naturalist, such as that typified by Dr. Holme's Scaribee, finds the work of a lifetime in a department of a subsection of Nature, a family of the Coleoptera, the Fauna of an islet.

To Linnæus the stupendous task of the entire classification of organic nature did not seem too vast or too laborious.

Later still we find naturalists who were content to be Entomologists merely, and shrank from annexing the whole of created life for their province. Such were the Scandinavians Schönherr, Gyllenhall, and DeGeer; Fabricius, the Dane; and above all Latreille, the French abbé. It was the work of such men as these which consolidated and shaped the study of insects into an accredited department of Zoology, and formed the framework of our modern Entomology. This was in the early years of the present century; and among all the nations of Europe, but more especially among the Teutonic peoples, the study was cultivated by a few observers who—although they added much to the great mass of ascertained knowledge—earned, generally speaking, but a mild contempt from their public, not so much because the objects of their care were in themselves unworthy or puerile, as because they lacked that touch of the transcendental fire of science which redeemed the efforts of the astronomer and the physicist.

For consider how the standpoint of all these workers, from Fabricius down to Edward Newman, differed from or fell short of ours; and great names they were in their generation, and much solid knowledge and irrefutable information we owe to their endeavours—Marsham, McLeay, Kirby and Spence, Westwood, Curtis, Stephens, Doubleday, Newman, Stainton, to cite only a few, and these our own countrymen.

Now consider for a moment, and with all respect to such past masters in Entomology, how limited was their sense of the domain they were investigating. They may all be divided roughly into two great categories—observers such as Newman and Kirby, systematists like McLeay or Westwood. Of course the majority were both; but we can separate the result of their labours, at any rate, under these two heads. Yet these observers, patient and reliable as were their researches, valuable as was the knowledge of Nature they acquired and bequeathed to us, never seemed to trouble themselves about the *meaning*, the *why* of phenomena, the *how*; the *methods* of things were enough for them. They desired simple facts, and enquired no deeper, sought no further into the reality which might underlie the apparent.

Was the habitat of *Erebia epiphron* or *Miscodera arctica* only the barren mountain tops? Was one insect restricted to a single island or tropic river valley, and another, like *Vanessa cardui*, abundant from China to Peru? Does one form correspond in perfect harmony of colour with its surroundings, while another glaringly contrasts with them? The mere facts were enough; why ask for reasons? so they were created in the beginning, so they would remain to the end; the only part for these students of Nature was to silently accept such arrangements as they found extant,—recondite speculation into their meaning and origin seemed to them to belong to a sphere into which it was almost impious, and certainly useless, to attempt to penetrate.

And the systematists, the workers in the study and the museum more than in the field, fared still worse. The observers did their work well, and laid foundations of solid knowledge which have since endured; but they were content with too little. The systematists started from the first from defective premises. Consider the endlessly complicated system of Stephens or of Westwood, and the elaborately symmetrical one of McLeay and Swainson, with their equal series of pentagons throughout all animated nature. What vast ingenuity, what endless toil! The whole the result of the hopeless endeavour to treat Nature as on one plane. Entangled and confused by their futile attempts to reduce all creation to some iron-bound theoretical conformity, they missed the inner meaning of half the phenomena they were investigating; embryology in our sense of the word gave them no light, and all those variations from type and deviations from the normal, which are such an interest, such a delight, and so suggestive to us, to entomologists of this period were nothing better than an embarrassment and a nuisance, unaccountable and unmeaning freaks of Nature, which refused to fall into their systems, and even threatened that stability and independence of specific form which was the root idea of all their theories.

Now if I seem to lay too heavy a stress on the defects of the older Entomologists, let it be seen that my purpose is to demonstrate, if possible, how wider, fuller, more really scientific, what I venture to call the *New Entomology* is than the old; what I mean by the old Entomology I date from the birth of the study as a distinct department of Zoology, or from the time of Latreille to the death of Edward Newman, whom I regard as typifying almost the last of the old school.

And one consideration strikes me at this point, that is, that the *New Biology*, which of course dates from the publication of the 'Origin of Species,' by no means synchronizes with the *New Entomology*. The contrast is indeed rather noteworthy between the comparatively little use Darwin himself made of inferences drawn from Entomology in original support of his theory, and the vast mass of confirmatory evidence since supplied by that branch of study. As a matter of fact I think the Entomologists of the fifties and sixties were too busy describing new species, formulating new genera, investigating insect morphology for the purpose of upsetting old, or establishing new arrangements—all genuine and indispensable work, the fruits of which we to-day enjoy, for we have to a greater extent than we can always appreciate entered into possession of their labours. They were, I say, so intent on this purely departmental work, so to speak, as to miss the consideration of the wider issues involved in that new aspect of Nature as a whole which was then beginning to surprise and captivate scientific Europe. Thus it seems that quite a long interval elapsed from the general provisional acceptance of the theory of Evolution by Biologists, before Entomologists as such (with indeed some notable exceptions, as Wallace and Bates) turned their attention anxiously to the subject, and began to see how Entomology under that influence might rise from a study to a science, how on the entomological arena some of the toughest biological battles might be fought, and how, by entomological methods, some of her profoundest secrets might be wrested from Nature.

This new departure, then, seems to be both so recent and so distinct as to justify me when I refer to it as the *New Entomology*. Its key-note is *Synthesis*, while that of the old school was *Analysis*. The disciples of the latter supposed that when every insect form in the world had been described and catalogued, and the whole of the order finally and unanimously arranged in methodical series of divisions, then their warfare would be accomplished and their occupation gone. We, on the contrary, know that even with such work perfected our real labours would be but begun.

The generation of students who were content when they had arranged in their cabinets irreproachable specimens of, say, all the known species of Vanessidæ, carefully neglecting all varieties or aberrations as blind and inexplicable errors on the part of Nature, have almost ceased to be. We not only require all known species of any group we may be studying, but we must have illustrated as well the whole gamut of variation; nay, more, we must submit larvæ and pupæ to strange conditions, freeze them and force them with a Merrifield and a Weisman, and induce variation unknown before,—our aim the discovery of some aboriginal form, some proto-Vanessid, an abstraction our fathers never so much as dreamt of; and to trace the broken lines of convergence, and elucidate the fragmentary records of descent, we study not only the morphology but the embryology of a group, not only normal but more especially varietal forms. So each spot and each line has its meaning and its derivation, and points backwards to some common origin, some type in which the present differentiation might have been originally merged. The runes of the mackerel's back were said of old to convey to him who could read them the darkest secrets of fate; more suggestive to the modern entomologist and more legible are the primæval hieroglyphics of the butterfly's wing. Consider, again, colour and markings, not in relation to descent but to environment, and as the result of adaptation. Such matters were formerly held as ultimate facts; a moth was either grey or white because its nature compelled it so to be; the case admitted no further investigation. Now, however, the specialization of colour and form is a distinct department of Biology, and we have books such as Poulton's 'Colours of Animals,' a work of the deepest interest, treating of a subject which simply had no meaning a generation ago.

(To be continued.)

AMONG THE DRAGONFLIES IN 1893.

By W. J. Lucas, B.A.

The bright and forward spring of 1893 saw the dragonflies, like other insects, very early on the wing. My first capture was a specimen of one of our noblest species, *Libellula quadrimaculata*, Linn., which was taken in Surrey on April 30th, by the edge of the Black Pond in Claremont Woods, near Esher. Later in the season this locality proved a splendid one for the species. These insects, however, were none too easily taken, for they delighted to forage up and down, usually out of reach of the net, over the surface of the lake, or amongst the lofty reeds that fringe its boggy margin.

L. quadrimaculata makes a grand show in the cabinet; for, whatever may be true of some other species, this one, if only the contents of abdomen and thorax are removed, loses scarcely any of the splendours with which it was adorned when living. The empty shell retains not only its shape, but its colour too. I use no stuffing, nor does any appear to be needed.

This neighbourhood, as well as other districts in the same part of Surrey, yield in good numbers a closely related insect, *Platetrum depressum*, Linn. The treatment mentioned for *L. quadrimaculata* succeeds even better, if possible, with *P. depressum* Should, however, the blue-powdered male show signs of grease, it may be removed with benzine, chloroform, or ether: I have had but one specimen so affected. The earliest specimens of this species, both male and female, that fell under my notice occurred in the New Forest, near Lyndhurst, on May 7th. The pursuit of *P. depressum* is a somewhat exciting matter, and its capture often requires a considerable amount of perseverance; for though the insect does not appear to be at all timid, it is nevertheless very restless. After allowing one to approach almost within striking distance it suddenly darts off, but as likely as not returns almost directly, and, may be, to the identical spray from which it started. Patience, however, usually finds our friend a prisoner in the end.

Seldom have I had the pleasure of witnessing a more interesting sight than the cloud of dragonflies that rose and filled the air as I approached the sunny banks of the Mole and neighbouring pools at Esher on May 14th. All but one specimen belonged to the remote-eyed section, Agrionina, but of these there were countless individuals of several species, among them being *Calopteryx splendens*, Harris, *Pyrrhosoma minium*, Harris, and *Agrion puella*, Linn., at least. These being all slow flyers, one was able to admire to the full the gorgeous colours of their bodies, or, in the case of *C. splendens*, the rich green or blue gauze of their wings. The last is indeed a glorious insect, but withal a clumsy one, and in my opinion not able to compare in grace of form with many of the members of the other section, Libellulina, One only of this section was taken that day, a good specimen of *Brachytron pratense*, Müller, which after being followed for some considerable time up and down the margin of a pool which it had chosen to haunt, and from which, after the manner of *P. depressum*, it was not easily scared, was at last secured.

On May 22nd the Black Pond was alive with *L. quadrimaculata*, but they were not easily captured, while its banks swarmed with the smaller Agrioninæ, most of them being *A. puella* I also took one specimen of *Cordulia ænea*, Linn., flying near the edge of the pond, and on May 28th saw two others, but could not catch them.

On July 28th I took *Æschna grandis*, Linn., in Bagley Wood, Berks, and, in the same locality, an *Æ. cyanea*, Müller, on August 26th.

On August 17th a few males of the genus *Calopteryx* were still flying over the surface of the Wye at Symond's Yat, and after some difficulty one was secured.

On Sept. 9th, in Bagley Wood, Berks, a male *Æ. cyanea* was sighted hawking along the side of a hedge. It presently made for a small butterfly, which looked like *Polyommatus phlœas*, and after circling round it several times, as if for the purpose of examination, secured it, and then began wildly careering about, as if rejoiced at its own dexterity. While thus engaged, a wing of the butterfly was seen to fall, and presently *Æ. cyanea* settled on the hedge, where it appeared to be further stripping its captive. I shortly afterwards caught the dragonfly, and found the body of the butterfly still between its jaws.

After some weeks' absence I again visited the Black Pond at Esher on Sept. 13th, and three specimens of *Sympetrum scoticum*, Don., were taken, two males and a female. The same day a specimen of *A. puella* was caught. About the same day I received a living female of *Æ. cyanea*.

On Sept. 17th several *S. scoticum* were seen (three taken) by the side of the Black Pond. They were not much in evidence when the sun was not shining, and even when on the wing did not move very quickly. Their flight, indeed, seems to be weak, but their colour renders it difficult for the eye to follow them when they are flying, They occasionally, especially if disturbed, soared away among the firs, but more commonly kept near the reeds and beds of *Sphagnum* which covered the now dry margin of the pond. One or two specimens of *A. puella* were still about, and one was taken.

My last captures of the season were made at the same place, on Sept. 24th. They consisted of a few specimens of *S. scoticum* and one of *A. puella*.

The neighbourhood of Esher is clearly a very prolific one; I myself took during the season at least eleven species there, and saw three others, but could not secure any specimens. Let us hope that the drought of 1893 may not affect their numbers in the season that will now so soon commence.

2, Gordon Road, Kingston-on-Thames, Jan. 9, 1894.

SIX YEARS' ENTOMOLOGY IN CO. GALWAY.

By the Hon. R. E. Dillon.

Having collected Lepidoptera, chiefly in this neighbourhood, during the last six years, I find that some of my captures prove of no ordinary interest. Last year I submitted my collection to Mr. H. de V. Kane for examination, and he identified all my specimens, and informs me that he considers this locality surprisingly rich, and that I should do well to publish a list of the rarer insects. Although unwilling to do so at first, owing to the risk of attracting undesirable collectors, as this estate is strictly preserved, it seems necessary that full particulars should be placed on record as to the occurrence of such rarities as *Naclia ancilla, Cloantha polyodon, Leucania extranea*, &c., as well as others that are new to the Irish list.

I therefore have yielded to Mr. Kane's suggestion and have put down those which seem to be of interest on account of local distribution in Ireland, as well as all rarities. I should say that at first I kept a meagre diary, and failed to identify several insects, in some cases not being satisfied as to their identity, on account of their rarity. In such cases I cannot give exact dates. In other cases, such as *Xanthia aurago, Cirrhœdia xerampelina*, I made sketches of the insects in my diary, which Mr. Kane at once recognised.

This district, characterised by a great variety of physical features comprising extensive oak woodlands, bogs with very diversified and interesting flora, interspersed with arable and grass lands on the limestone formation. The climate is mild, but not so much so as that of the sea-coast of this county, which is distant about thirty miles at the nearest inlet, namely, Galway Bay. It is remarkable that some of the insects taken here are, I believe, usually confined to the sea-coast

At the beginning, not being acquainted with many of the *Eupithecia* and small Geometers, I neglected to work for them, which accounts to a certain degree for only single specimens, and the list therefore does not fairly represent the proportionate abundance of the local species of the group.

I hope it will be understood that, where no locality is given for the capture of any insect in the following list, the insect in question was taken in this demesne. Except during the visits of Mr. Kane and Mr. G. V. Hart, all insects were taken by me, with the assistance of the gamekeeper, Francis Mason, or during my occasional absences by the latter alone. A great number were taken in an illuminated moth-trap. During the early spring and summer of 1893, I had the advantage of working here with Mr. Kane, and I feel I must express my great indebtedness to him for his unvarying kindness, not only in identifying my insects, but for much valuable help and instruction in the study of entomology and the practical working of it, which he has so generously accorded me ever since I have had the pleasure of his acquaintance.

RHOPALOCERA.

Gonopteryx rhamni. Not uncommon; a few seen every year; fairly common in 1887. One female taken late in the year with semicircular cusps in fore wings; now in Mr. Kane's cabinet.

Argynnis adippe. I took several specimens in 1887; one specimen, July 3rd, 1893.

Melitæa aurinia. Fairly common. I have never seen any varieties here.

Vanessa io. Fairly common. I saw more in 1893 than in any year before. I took one, Christmas Day, 1892.—*V. atalanta*. Very abundant. I have also taken several hybernated specimens. *V. cardui*. A few specimens are seen yearly; never abundant.

Satyrus semele. Not common, I took one very ruddy female, almost approaching var. *aristæus* (*cf*. Mr. Kane's list of Irish Lepidoptera).

Epinephele tithonus. One specimen.

Thecla quercus. Occasionally seen here. I took one at Dalyston Wood, at Kilglaunah, June 21st, 1893, with Mr. Kane, Loughrea, Co. Galway.—*T. rubi*. Common. I secured a curious aberration in June, 1893, which Mr. South has kindly described on page 17 of this volume.

Lycæna astrarche var. *artaxerxes*. I took specimens of this, July 3rd, identified by Mr. Kane. I have taken other specimens here before, which have been destroyed through neglect. I believe it appears here every year in small numbers.

HETEROCERA.

Acherontia atropos. I have never taken a specimen here, but I saw one on a wall near my moth-trap. One previously had been found in the dining-room in the morning.

Smerinthus ocellatus. Very abundant. Several specimens were taken this year in my moth-trap and, except the year 1893, I could have brought in from thirty to forty larvæ whenever wanted.—*S. tiliæ.* I have taken several specimens here, but it is very far from common. One specimen which Mr. Kane has preserved has been described by him. All taken flying about lime or privet at dusk.

Sesia culiciformis. I took two specimens hovering over some bramble-bushes, June 25th, 1893. Mr. Kane showed me many birch-logs perforated by the larvæ.

Naclia ancilla. Two taken flying at dusk in the wood (oak).

Nola cucullatella. I took six specimens, July 18th and 19th, and August 15th and 21st; also I have an old worn insect taken in 1888, which I believe to be referable to the same species.

Calligenia miniata. I have taken several specimens both at light and flying at dusk, at the end of June and July.

Gnophria rubricollis. Only one specimen has been taken alive, although I have picked up several dead on roads.

Spilosoma fuliginosa. Several specimens; one yellow variety described by Mr. Kane in his Catalogue of Irish Lepidoptera and now in his cabinet. (*cf.* 'Entomologist.')—*S. mendica.* One male of a smoky colour, similar to the English form.

Hepialus sylvanus. Two specimens, July, 1892, flying at dusk round flower-beds not far from the house.—*H. velleda.* Occasionally seen though not common.

Zeuzera pyrina. Two specimens; one adhering to a standard rose-tree, taken by the gardener, July, 1892; the other at light.

Macrogaster castaneæ. One specimen, a female, fell into a boat pushed through reeds on the edge of a small lough near Kilconnell, when going to fish, July, 1891.

Leucoma salicis. Not uncommon, but larvæ rather difficult to breed. Took one imago in the daytime, half hidden in a sallow-bush.

Heterogenea limacodes. In 1892 I captured two females flying at dusk in August. Two specimens also in June, 1893, flying round flower-beds.

Dasychira pudibunda. Several specimens in moth-trap early in May, 1893.

Pœcilocampa populi. Not uncommon.

Bombyx rubi. Not common; larvæ very abundant on all bogs in 1890. I hardly saw one this year.

Drepana lacertinaria. Very common.—*D. falcataria.* Have only taken one imago, though larvæ were found in 1891 and 1892; none emerged, owing probably to the defects in my breeding-cage.

Dicranura furcula. As common as *D. vinula.*

Ptilophora plumigera. One specimen taken September, 1892, on the staircase window, attracted by the light within.

Notodonta dictæoides. Five specimens taken in my moth-trap from May 15th to May 21st, 1893. These were taken only when the moth-trap was placed on the old Clonbrok Castle, about sixty feet from the ground.—*N. chaonia.* Six insects in my moth-trap in May, placed in position as above.

Cymatophora or. One specimen in 1892; date uncertain.

Bryophila muralis. One specimen taken flying *near* sugar, July 20th, 1891.

Moma orion. Three specimens taken and some larvæ which I did not succeed in rearing. I saw an imago, on a hemlock-flower, with Mr. Kane, at Mote Park, Co. Roscommon, but failed to take it; July 19th, 1893.

Acronycta leporina. Have taken several specimens; all are but slightly marked with black. Not common.—*A. aceris.* One specimen, July, 1891.—*A. megacephala.* Two specimens, July, 1891; one larva on poplar, 1893.

HOW MOTH-GREASE SPREADS.

By H. Guard Knaggs, M.D., F.L.S.

In the 'Entomologist' for April last (xxvi. 110), Mr. Anderson broached a subject which may, for one thing, have useful results in teaching us to pin our insects on fixed rules. He remarks:—"Now it seems to me that grease does not always emanate from the abdomen, but at times exudes from the thorax, and spreads from the silky hairs clothing the thorax—oftentimes a part of exceeding beauty—and covers the wings, and then it is that grease is indeed a nuisance. I may be displaying my anatomical ignorance here, and it may be that it is impossible for grease to exude from the thorax. All I can say is then that many insects, inter alia, *Demas coryli*, appear to grease in the thorax before any trace of it is seen in the bodies." On p. 149 in the same volume the Rev. Joseph Greene, in reply to Mr. Anderson, says:—"He (Mr. A.) then suggests that grease may emanate from the thorax, and not from the abdomen. I have never heard or read of this theory before, and I cannot think that there is the slightest foundation for it." And then the matter dropped.

Mr. Greene's theory, we know, is that "It (grease) first appears in blotches on the abdomen, and, if neglected, extends to the thorax, corroding the pins, unless black pins be used; thence to the wings, and finally to the paper." Now, so far as my own experience goes, moth-grease *may* first become visible on the thorax *under certain conditions*, while it can never pass direct from the abdomen to the thorax *under ordinary circumstances*, the metaphragm having no opening except for the passage of intestines, vessels, &c., and being, moreover, of a tough, impermeable nature; consequently the abdomen being the great reservoir of the grease, the order of outward and visible signs is generally as follows:—The first appearance is on the abdomen in one or more places, especially towards the anal end, then it extends to whatever may be in contact with the greasy surface; it may be to the paper of the saddle, box, or cabinet, or to the hind wings if too close to the body; or it may spread along the abdomen, reaching the *surface* of the thorax and insertions of the wings simultaneously, over both of which it may spread, until it arrives at the pin, either at its ingress or egress, when it at once commences business in earnest, and for the first time enters the thorax itself, beginning its work of destruction by corroding the pin (black enamelled pins not being always proof against its attack, owing probably to some defect in the coating, as was recently observed in examples of *Macrogaster arundinis* received from a correspondent in the north); sometimes distending the thorax, by chemical action on the metal of the pin, even to bursting, as in a case of *Sesia scoliiformis* now before me; and lastly, as Mr. Greene observes, it finds its way to the paper which surrounds the pin. Such I believe to be the usual order of events where a greasy specimen, especially if a bred male, of a greasy species, is allowed to take its course without attention.

Grease may, however, behave differently; it may pass from the abdomen to the hind wings, thence to the hinder half of the fore wings. It may be only on one side, as in a case of *N. typhæ* (before me), in which the abdomen, right hind wing, and hinder half of right fore wing are saturated, the paper being stained by the tip of the fore wing, while the thorax and left side are in their normal state. In another case the hairs of the anal tuft alone were greasy, the grease being communicated to the paper; and it is by no means uncommon to find the fore part of the thorax of an insect, otherwise as greasy as can be, untouched. As to the points at which grease may become first visible, I have been credibly informed, by one who ought to know, that the centre of the fore wing is one of them.

This brings us to the conditions under which moth-grease may make its first appearance on the thorax, an occurrence which may possibly be more common than is generally supposed. It may happen when the insect has been transfixed in the posterior part of the thorax, with the point of the pin slanting backwards in such a manner as to pierce the metaphragm and enter the abdominal cavity, in which case a portion of the pin passes through and remains in actual contact with the grease, which it must be recollected is at that time in a very soft state; the insinuating oily matter of the ruptured cells, aided by capillary attraction, finds its way along the periphery of the pin, thus providing an outlet for the exit of the fatty matter as it becomes disintegrated, which is thereby diverted from its usual course,—the barrel is tapped, so to speak,—for it is surprising how steadily the enemy follows the metal, when once it has reached it; and so, as the greasy mass becomes liquefied, it flows along the passage which has been formed for it instead of permeating the tissues and making its first appearance on the surface of the body. In examples of insects which have been pinned in this manner, when the abdomina are detached, the pin is exposed to view over a considerable portion of its length, and if the specimen be an old one, the green cupric-salt will indicate the position of the pin in its entire transit through the specimen.

It will be interesting to know whether the *Demas coryli*, &c., referred to by Mr. Anderson, have been pinned in the way indicated. It is in those species which have the thorax clothed with long hairs which overlap the abdomen, making it appear to be larger than it really is, and giving a bison-like look to the insect, that the collector is apt to be fogged as to the whereabouts of the centre of the thorax. In such cases, transfix the insect well to the fore; don't give a too backward slant to the pin-point, and always remember, *in medio tutissimus ibis.*

Folkestone, Jan. 7th, 1894.

REMARKS ON CERTAIN GENERA OF *COCCIDÆ*.

By W. M. Maskell.

(Continued from p. 46.)

The Group *Hemicoccidinæ*, Mask.; and the Genera *Asterolecanium* and *Planchonia*.

During the year 1892 I received from Mr. Olliff, of Sydney, some specimens which, after close examination, I place in the genus *Kermes;* and as this is the first species of that genus which I have had occasion to describe in detail, I venture to repeat here the characters ascribed to the group *Hemicoccidinæ* in my paper of 1883 (N. Z. Trans. vol. xvi.), and in my 'Scale Insects of New Zealand,' 1887:—

Adult females exhibiting the anal cleft and the lobes of *Lecanidæ:* naked or covered.

Larvæ presenting at the extremity of the abdomen the anal tubercles of *Coccidæ.*

From the foregoing characters the group is very evidently intermediate between Lecanids and Coccids.

When, in the years just mentioned, the formation of this group was proposed, I possessed specimens of three out of the eight species of the genus *Kermes* which forms part of it:—*K. vermilio,* Planchon; *K. bankinii,* Planchon; and *K. galliformis,* Riley. Since then I have received from Mr. Newstead an African species, *K. quercus,* Newst., and now have another from Australia, which I propose to name *K. acaciæ.*

In 1883 I attached to the group the two genera Astero-

lecanium, Targioni, and *Pollinia*, Targioni; and in 1881 (following Signoret) I had placed *Planchonia*, Sign., amongst the Coccids. Previously, all these three genera had been included amongst a Lecanid section, to which Targioni had given the name "Lecaniodiaspidæ." This name appeared to me to be so singularly inappropriate, seeing that none of the genera placed under it had any Diaspid character and that their larvæ were certainly not Lecanid, that I declined to continue so confusing an arrangement; I placed under the Lecaniodiaspidæ such genera as *Ctenochiton*, *Ceroplastes*, &c., which fitted it, and divided the others according as their characters seemed to direct. One genus—*Lecaniodiaspis*, Targioni—I was obliged to leave alone, knowing nothing about it; nor do I know if anybody has ever since seen it.

The exigencies of my book on 'Scale Insects of New Zealand' in 1887 unfortunately compelled me to extreme brevity. The work was intended primarily for the use of settlers in the colony, and much scientific detail would have been out of place; as it was, the book was scarcely published before I was told "there was too much Latin in it." Some friends of mine who, of late years, have taken up the study of Coccids and who have had occasion to touch upon some of the genera just mentioned, have not given me credit for at least thinking there was some good reason for my action. My papers of 1881 and 1883 have been ignored and my classification set aside, probably because in 1887 it was not reasoned out in detail. The old Lecaniodiaspidæ, including *Planchonia* and *Asterolecanium*, have been made to do duty still. The larval form of *Asterolecanium* has been unnoticed; the anal tubercles present in all stages of *Planchonia* have not been considered; and the confusion introduced by Targioni in 1868 has been perpetuated without discussion of important points. Mr. Ashmead, in his 'Generic Synopsis of *Coccidæ*,' 1891, adheres to Targioni's system; he is followed by Mr. Cockerell in 'Science Gossip,' 1893; and neither writer pays any attention to the anatomical characters of the insects. "Priority of authorship" has been taken as sufficient; the "rules of nomenclature," said to be binding upon all zoologists, have been made to override common-sense, clearness, and convenience. I must demur to this, and cannot agree to leave in the Lecaniodiaspidæ genera which are not at all Diaspid, nor in all stages Lecanid.

Signoret (Ann. de la Soc. Ent. de France, 1868, p. 282) says of the adult *Asterolecanium miliaris*:—"This species is clearly Lecanid, the anal extremity being cleft, with anal lobes"; and he further remarks that it closely resembles *A. bambusæ* and *A. aureum*. In my paper of 1883 I drew attention to this point, stating very clearly that it prevented me from treating *Asterolecanium* like *Planchonia*, and placing it amongst the Coccids. But

Signoret also states that the larva of *A. aureum* and the larva of *Pollinia costæ* have the anal tubercles of Coccids. Consequently, it seemed to me equally impossible to leave these genera amongst the Lecanids proper. And so, in 1883 and 1887, I grouped *Pollinia* and *Asterolecanium* with *Kermes*.

Professor Targioni has, I believe (though I have not seen his paper), lately in 1893 made further observations on *Asterolecanium aureum*, and concluded that it is really a *Planchonia*. If that is so, it must have the anal tubercles of a Coccid. Possibly it may be found some day that *A. miliaris* and *A. bambusæ* are in like position. As to *A. quercicola*, I have long had doubts about it; and, indeed, whenever anybody has sent me specimens under the name of *Asterolecanium*, I have always found them turn out to be *Planchonia fimbriata*, Fonscolombe. Perhaps, therefore, the whole genus may have to be abandoned some day, and *Pollinia* and *Lecaniodiaspis* may share the same fate. But (and this is the important point for the present) *until Signoret's statements quoted above remain uncontradicted*, there is a genus in which the larva is Coccid and the adult Lecanid, called *Asterolecanium*, and this must therefore be placed in a group with *Kermes*, intermediate between Lecanids and Coccids. *Planchonia* is altogether Coccid. The two genera must therefore be separated, and under no possible conditions can either of them be placed with the Lecaniodiaspidæ. Reasoning such as this I believe to be the only true basis of proper classification.

(To be continued.)

ON CERTAIN VARIETIES OF *SPILOSOMA LUBRICIPEDA.*

By W. H. Tugwell.

During 1892 and '93 I bred in some numbers from two selected forms of *Spilosoma lubricipeda*, and the following note may be of interest.

S. lubricipeda, as we know it in the South of England, is not a particularly striking species, the principal and characteristic markings being an oblique row of more or less clearly defined dots or short streaks, starting from the apical costal margin to the centre of the inner margin on the fore wings, whilst on the hind wings two or three black dots or spots comprise the typical London form.

In 1892 I was at Hailsham in company with Mr. Porritt, who had with him a lot of pupæ of *S. lubricipeda*, the imagines from which were then fast emerging, and from which he was expecting to breed some vars. of the *radiata* of Curtis; but not one of them proved of that type at all, the form shown being quite in another direction, *viz.*, they (that is, a goodly number of them) developed a more or less defined central fascia in bold outlines, and the oblique row of spots was almost wanting. They were sufficiently striking to induce me to carry on the brood yet another year; so a strongly-marked pair were selected, and the brood from them carefully fed up on *Sambucus nigra*, with the result that during May, 1893, I bred a very long series (several hundred), and the picked examples of that brood are indeed a most striking lot; the fascia-like lines are considerably increased, so that the fascia is clearly and boldly shown on all four wings; and for this most striking type I propose the name of var. *fasciata*. In many of the specimens this fascia line is in the distinct form of the mark of a note of interrogation, and forms a most charming variety. The whole brood was very robust, large in size, and rich in colour, the males being of a deep ochreous-yellow ground colour, the female nearly white. Fully 50 per cent. of this brood came out quite the pale and typical southern form! and from this they ranged up to the grand var. *fasciata*. A very fine female of this form copulated with a male var. *radiata* = *zatima*, and the result of that pairing, now in the pupa state, is anxiously awaited.

In June, 1892, Mr. Harrison, of Barnsley, most kindly sent me a small batch of ova from a pairing of two specimens of var. *radiata*, Curtis = *zatima;* and these larvæ were fed up on elder, at the same time as the former brood referred to as *fasciata*,—of course kept quite distinct. No difference could be discerned between the two broods of larvæ. Possibly the *radiata* form may, on the whole, have been a trifle darker, but any way the darkest *fasciata* a long way overlapped the palest *radiata:* you could not possibly pick them out if by chance they had become mixed.

From these 1892 larvæ I bred twenty-seven examples during April and early May, 1893, all true *radiata*. Two good forms of these were paired, and a large brood reared. During July, August, and September a long series of grand imagines emerged, every one of the *radiata* type; not a single one relapsed into the normal *lubricipeda* form, although a few ran extremely pale; one particularly had the under wing very closely approaching my var. *fasciata*, but it was not quite identical. I should mention that many of this brood still remain as pupæ. That *radiata* is strictly only a form of *lubricipeda*, is to my mind proved by the ready crossing of the two forms, and by the fertility being well kept up in these crossed results. The rule is for hybrids or mules to lose their fertility; that being so, it is very strong evidence that—divergent as the two extremes may be—still they are only forms of one very variable species.

Mr. G. T. Porritt, in his List of Yorkshire Lepidoptera, speaks of York city producing the var. *radiata;* this he has since corrected (Entom. xxvi. 296), and it now appears that the York form differs considerably from true *radiata*. In the former the black markings on all the wings are much increased both in number and definition, but the oblique spottings are well marked and intensified. This form has a radiated appearance, but is most distinct from the true *zatima*, which has for a long time been found very sparingly on the coast of both York and Lincolnshire. An uncle of Mr. W. H. B. Fletcher took a few examples of *zatima* on the Lincolnshire coast many years since, one of which he sent to Curtis, one he gave to the elder Mr. Dale (the late J. C. D.?), and one is still in Mr. Fletcher's collection. It was also reported from Driffield, and there is a figure in the 'Entomologist' for 1874.

The locality in England for *radiata* = *zatima* is evidently on the east coast, near the River Humber, Hull and district, Grimsby and district. The probable reason of the occurrence of this form in the districts mentioned is not difficult to assign. The vast number of vessels, fishing-craft, &c., constantly running into these busy ports, on the Humber, afford a most facile transit from the coast of Heligoland. This insect is much attracted by light, and the masthead lights of these many vessels would almost certainly be a great lure to the moths, which being attracted would be sure to rest on some portion of the rigging after their flight. A few hours' run, and they would be safely landed on English soil. Even their own unaided flight would readily effect the same result.

Now, whilst having the most perfect confidence in the *bona fides* of Mr. Harrison, when he states that his one original female was bred by him from London pupa, still I cannot help thinking it far more probable that it was rather one of the Grimsby pupæ that he had at that time: it is so easy to get a little confused, particularly when dealing with a very common species such as *S. lubricipeda*, when naturally no particular pains would be taken, as no such stroke of luck as breeding *radiata* from them was anticipated.

London has never produced this variety, so far as is known; neither, perhaps, is it likely to do so, as *radiata* is not an aberration simply, but rather a strong local form, and in all probability the outcome of very many generations of isolation in Heligoland.

16, Lewisham Road, Greenwich, S.E.

THE GENUS *PHILOMETRA*, GROTE.

By A. G. Butler, Ph. D.

In his recent 'Catalogue of Noctuidæ,' Prof. Smith permits this genus to stand as distinct from *Herminia*; but the *Herminia* of Smith he regards as synonymous with *Chytolita*, Grote.

The male of *Chytolita* has the antennæ ciliated, and with a prominent knot below the middle. The group which it represents corresponds with Lederer's typical *Zanclognatha.*

On the other hand, Dr. Moore, who worked out the synonymy and fixed the types of genera for his work on the 'Lepidoptera of Ceylon,' gives *H. barbalis*, Clerck, as type of *Herminia.* From the latter, I have been unable to distinguish *Philometra.*[*]

Lederer erroneously separated *H. barbalis* from *Herminia*, and made it the type of his genus *Pechipogon* (Hübner). Moore quotes the latter in his synonymy of *Herminia.*

Under *Philometra*, Prof. Smith quotes two species, *P. goasalis* and *P. eumelusalis.* With regard to the first, I have a few remarks to make, which I hope Prof. Smith will accept in the friendly spirit in which they are intended. The following is the species as rendered by Prof. Smith, and he must forgive me for thinking that the synonymy was written down hurriedly.

First of all he calls the species:—

P. GOASALIS, *Wlk.*

1859. Wlk., C. B. Mus., Het. xvi. 134, *Epizeuxis.*

I looked out this reference, and found no trace of Walker's species; but in vol. xix. p. 876, I found *Epizeuxis gaosalis* (sic).

The next reference is:—

1859. Wlk., C. B. Mus., Het. xix. p. 876, *Epizeuxis. metonalis*, Wlk.

This also was not on the page indicated; but in vol. xvi. p. 236, I found *Herminia metonalis*, Wlk.

The third reference is:—

Wlk., C. B. Mus., Het. xvi. 236, *Herminia. longilabris*, Grt.

But on p. 236, Walker gives no reference to Grote's species.

Now it is perfectly evident that the first reference (Het. xvi. 134) was not required at all; the page quoted merely gives us an enumeration, with diagnoses, of certain species of *Epizeuxis* described by M. Guenée: take away this reference, shift the others up, and all references become correct; excepting that the species is *gaosalis* not *goasalis*, and should be called *metonalis.* The effect of this confusion in the synonymy is, that a mistake has also been made in the note succeeding it, viz.: "Under *goasalis*, Walker has also a specimen of *Herminia petrealis*, Grt., which he did not recognize as distinct."

Now anyone can satisfy himself, by looking up the correct reference to Walker's *Epizeuxis gaosalis*, that only one example ever existed under the name; nor did I find any example which could by any possibility be mistaken for a member of the group in the drawer with it. But, under *Herminia metonalis*, there is a somewhat aberrant example (the type), with an oblique dusky costal dash on the primaries, which hardly looks like typical *H. gaosalis*, and may be the specimen intended. It is not, however, congeneric with Grote's *H. petrealis*, because its antennæ are shortly pectinated and without nodosity.

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[*] Grote states that the antennæ are shortly pectinate, without nodosity, as one of the characters for *Philometra*, in which he is quite correct.

Prof. Smith will probably point out that his lines end with a full stop, and therefore that the specific name which follows belongs to the reference on the succeeding line. This may be so, but then what becomes of the first reference following the specific name P. Goasalis, *Wlk.* (sic), and which has nothing whatever to do with the species, inasmuch as the page quoted does not include either of the forms quoted as belonging to *Philometra*.

To my mind the simplest form of reference, and that least likely to lead to mistakes, is that usually adopted in England. This would give Walker's species thus :—

Herminia metonalis.

Herminia metonalis, Walker, Cat. Het. xiv. p. 236.
Epizeuxis gaosalis, Walker, Cat. Het. xix. p. 876.
Philometra longilabris, Grote, Tr. Am. Ent. Soc. iv. p. 99.

Nova Scotia and Hudson's Bay. In B. M.

As before stated, I should be much astonished if none of these inaccuracies existed in Prof. Smith's very admirable work; they could hardly be avoided. But, in a later edition of the Catalogue, whenever a further revision is needed, they ought to be corrected. Therefore I feel that they should be at once recorded. No true entomologist is ever impatient of just criticism, but desires before all things to arrive at the exact truth; and, as regards the points adverted to in the present communication, anyone who has a copy of Walker's Catalogue can test their accuracy for himself.

NOTES ON *MESAPIA PELORIA*, Hewitson, AND ITS ALLIES.

By W. F. Kirby, F.L.S., F.E.S.,
Assistant in Zool. Dept., British Museum (Nat. Hist.), S. Kensington.

"Green-veined white" butterflies are very numerous in Central Asia, and in 1853 the late Mr. Hewitson described a curious insect from Chinese Tartary, respecting which he remarked: "This species, except that the nervures are different in their arrangement and the antennæ longer, has more the appearance of a *Parnassius* than of a *Pieris*, and would probably be more naturally placed in that genus. It is at any rate an admirable link by which to connect the two genera. It flies at a great elevation on the mountains of Chinese Tartary."

In 1887 Alpheraki re-described this species from N. E. Thibet, under the name of *Aporia lama*.

Acting on Hewitson's suggestion, Gray, in 1856, established the uncharacterised genus *Mesapia* for *Pieris peloria*, Hew., placing it between *Hypermnestra helios*, Nick., and *Doritis apollina*, Herbst, and this is the position which has generally been assigned to it in our catalogues.

A second species of *Mesapia* (*M. shawii*) has been described by Bates, and subsequently made the type of a new genus, *Baltia*, by Mr. F. Moore, as one of the Pierinæ. The references are as follows:—

Genus Baltia.

Moore, Ann. Nat. Hist. (5), i. p. 228 (1878).

Baltia shawii.

Mesapia shawii, Bates, Henderson and Hume, Lahore to Yarkand, p. 305 (1873).

Baltia shawii, Moore, 2nd Yarkand Exped. Lep. p. 3, t. 1, f. 5 (1879).

I have been able to examine specimens of this insect belonging to Mr. F. Moore; as well as others belonging to the Hope collection at Oxford, through the kindness of Dr. Dixey; and it proves to be a true Pieride, with a superficial resemblance to *Pieris leucodice*, Eversm.; but differs from all the genera allied to *Pieris* and *Aporia* by the very large club to the antennæ, and the short, broad hind wing-cells, which are almost truncated at the end and scarcely angulated. There is only one radial nervule, springing from the subcostal nervure just beyond the end of the cell in the female, and considerably beyond in the male. The claws are bifid, and the wings are fringed. On the fore wings it is very difficult to make out more than four subcostal branches (Moore says there are five); and on the hind wings the cell is broader and shorter than in *Mesapia*, and the lower submedian nervure is indistinct and very short, reaching the hind margin at one-third instead of two-thirds of the distance from the base to the end of the upper submedian, which latter is the arrangement in *Mesapia*. I need not characterise this genus in further detail, as Moore has done so.

Groum-Grschimailo re-describes and figures *Pieris shawii* (Romanoff, Mem, iv. p. 222, t. 10, f. 2 *a*, *b*); but his figures differ so much from Dr. Dixey's specimens that they probably represent a distinct but allied species, unless the insect is very variable.

Synchloe butleri, Moore, from Lahoul (P. Z. S. 1882, p. 256, t. 11, f. 6, 6 *a*), is a second species of *Baltia*.

Oberthür (Études d'Ent. iv. p. 19, pl. ii. fig 1) describes, under the Papilionidæ, a new genus and species from North China, which he calls *Davidina armandii*, and which he places between

Calinaga (now recognised as belonging to the Nymphalidæ) and *Parnassius*.

Notwithstanding the extraordinary neuration of this insect, especially on the fore wings, the presence of two submedian nervures on the hind wings, and of a third false one beneath, seem to indicate that its true affinities are probably with *Aporia*, *Mesapia*, and allies. See also Leech (Butt. China, Japan, and Corea, p. 474, pl. xxxiii. fig. 9), who properly places *Davidina* in the Pierinæ, and refers to it as resembling *Mesapia peloria*.

Schatz (Exotische Schmetterlinge, ii. p. 59, 1886) discusses *Mesapia* and *Baltia*, and pronounces both to be probably Pieridæ.

An examination of *M. peloria* proves this to be the case. The claws are bifid, and there are two submedian nervures on the hind wings. Of the described genera *Mesapia* is nearest in neuration to *Aporia* and *Metaporia;* but the density of its scaling and the hairy fringe of the wings will distinguish it from the former; and the long hairs at the base of the wings, the very long club of the antenna, and the peculiarities of neuration detailed in the description, will amply separate it from both.

Genus MESAPIA.

Gray, List Lep. Ins. B. M. i. p. 92 (1856).

Palpi long, rather pointed; antennæ long, moderately stout, with a large but gradually formed pyriform club. Body and base of wings clothed with very long slender hairs; fringes with shorter hairs; claws of front tarsi distinctly bifid; wings short, rounded, densely scaled; front wings very broad, subtriangular, costal nervure about two-thirds of the length of the wing, subcostal four-branched, the first branch emitted at about three-fourths of the length of the cell, and running obliquely to the costa, the second emitted at or a little before the end of the cell and slightly arched, the third emitted a little beyond the cell and running to the costa just before the apex, the fourth emitted about half-way between the end of the cell and the apex, and running to the hind margin just below the latter. Disco-cellular nervules oblique, the discoidal and median nervules nearly straight. Hind wings with the upper subcostal nervule emitted at half the distance between the base and the upper disco-cellular nervules; the nervules running to the hind margin straight, and at nearly equal distances apart; a well-marked basal cell; two submedian nervures.

Type *Mesapia peloria*.

Pieris peloria, Hewitson, Exot. Butt. i.; *Pieris*, t. 2, f. 15, 16 (1853); *Aporia lama*, Alph. Romanoff, Mém. Lep. iii. p. 404 (1887).

Greenish white, with the nervures broadly margined with grey, and grey spots on the nervures on hind margin of the hind wings. Under side of hind wings yellowish white, tinged with orange, with all the nervures strongly bordered with brown, as is also a fold so strongly marked as to look like an additional submedian nervure below the medial; costal area and basal cell orange.

NOTES AND OBSERVATIONS.

Earlier Publication of the 'Entomologist.'—Several of our supporters who are not prepaid subscribers have complained from time to time that they are not able to get their copies of this journal until about the end of the first week in the month. To obviate this difficulty in the future, we have determined to publish on the usual magazine day, *i.e.*, the 25th instead of, as hitherto, the last day of the month. Country booksellers should, therefore, henceforth receive the 'Entomologist' with the other "monthlies." Under this new arrangement, the latest date for Exchange Lists will be the 22nd of each month.

On the Cocoon of Epinephele ianira.—In dealing with another subject I casually referred (*ante*, p. 23) to the cocoon of *Epinephele ianira*, and did so in a way no doubt to suggest that *ianira* always made a cocoon. This is of course not the case. *E. ianira* makes a cocoon very rarely; it often, however, does some spinning that is in its essential nature a cocoon, and rarely perhaps fails to do a little more than make merely such a pad as *Vanessa urticæ* or *A. paphia* does. My casual reference, therefore, if taken *au pied de la lettre*, requires modification and apology, the latter more especially, as after I had written it I let it go, thinking, somewhat maliciously perhaps, it might in some degree awaken some of those to whom the fact was new, little suspecting that my friend Mr. Frohawk was of the number (*ante*, p. 66). As a matter of fact, my really careless allusion, made and intended to be taken rather loosely, is more correct than Mr. Frohawk's point-blank assertion to the contrary. This species is indeed in this matter most interesting. Certain Satyrinæ—*Satyrus semele* for example —have lost the power of hanging themselves by the tail, and make something that is perhaps fully entitled to be called a cocoon. *E. ianira* has made some advance in this direction. The power of suspension is so far dwindling that, the cremaster being badly provided with hooks, the larval skin is retained to assist the suspension. It also very usually pulls together several grass stems or other adjacent objects, and ties them together with silken cables, so as to form a tent around the stem selected for suspension. It is rare to find none, or so few as one such cable. Such a structure is no doubt, as I have said, in its essential nature a cocoon. On one occasion, and when I was inclined to restrict the name cocoon to some such structure as is made by *Saturnia carpini* or *Arctia caia*, I met with an instance of *E. ianira* making what I felt obliged to call a cocoon. In the autumn of 1886 the late Mr. Hellins, who was working up the butterfly material required to complete the histories left imperfect in the volume of Buckler's 'Larvæ,' sent me larvæ of *E. ianira*. It would appear that I forced some of these, and on Jan. 20th, 1887, I wrote him:—"I have to tell you that *E. ianira* spins a cocoon, perhaps hardly so good a one as *sambucaria*, and therefore perhaps you will deny it the name. I gave him no chips, no sawdust, sand or anything to go into; but he goes to the bottom of the tumbler amongst a lot of short grass, and ties various portions together and to the glass with cables, so, magnified" (sketch), "and these are numerous enough to justify (the name) cocoon being applied to the structure. He has settled down about the middle of the upper slope, and is nearly ready to change—I cannot put in the rest of grass and cables" (sketch). On Jan. 22nd I sent glass, &c., to Mr. Hellins. On the 27th he writes:—"Thanks to your packing, tumbler and pupa have come safely. I haven't examined the latter thoroughly yet, but sufficiently to see several little cables of silk, with elaborate fastening to the glass, and the grass blades are plainly held together. I daresay I have a dozen little larvæ. I hope some of them will show similar cunning." On Feb. 8th:—"*E. ianira* came out yesterday." He made no further report on the cocoon. Unfortunately, at this time his letters tell me of much suffering from toothache, neuralgia, &c., which terminated so soon after in his lamented loss. On April 28th I wrote to him:—"My four *ianira* (some, I suppose, I did not force) are now three in pupa and one hung up. Each has thrown out a cable or two, one several, and one has tied some grass together; but in no case has anything been made that could be called a cocoon, as might fairly be done with the one I sent you. The intention is, I think, of the same nature as a cocoon, in the case of the one that has drawn together some grass, namely, hiding and protection, something more than merely steadying the stem to which pupa is affixed. Curiously enough, all of them have suspended themselves to the glass; in each case stiffly by medium of cast skin, and at an angle and not mere suspension" (sketch showing angle to be about 50°). I need not say none of these letters were written with any view to publication. I have made no observations since that do not confirm these, and the only change I should now make in describing them would be in the direction of regarding all these instances of cables, drawing grass together, &c., as having to be described as cocoons.—T. A. Chapman; Firbank, Hereford, February, 1894.

The Burney Collection (Heterocera, continued from p. 69).—A fine series of fifteen *Cleora angularia* (= *viduaria*) was broken up into three lots of four examples in each, and two of these were purchased at £2 17s. 6d. per lot; the other lot went for £3 3s.; and three specimens, together with six of *C. glabraria*, fetched 35/–. The two lots of *Acidalia*, in each of which a specimen of *A. perochraria* was included, sold for 12/– per lot; and two others, each containing an example of *A. herbariata*, found purchasers at 15/– to 20/–. The latter, however, included a specimen of *A. osseata*. Two specimens of the last-named species, seven of *A. circellata*, and others, realised 37/6; and other lots, in which half-a-dozen *A. circellata* formed part, sold for £2 and £1 17s. 6d. A scratch-lot, in which were one *A. herbariata*, nine *A. mancuniata*, nice banded forms of *A. marginepuncta*, &c., only made 10/–; and for a nice useful assortment of some fifty-four *Acidalia* including "one *strigaria* taken by Mr. Button near Gravesend, 1870," the bidding would not advance beyond 5/–. In the case of some lots, containing such insects as *Lythria purpuraria*, *Sterrha sacraria*, among others, it was not apparent whether the bidding was influenced by a desire to possess the "plums" in the lot, or only the commoner things therein, *e.g.*, lot 247, "*carbonaria* (6), *conspicuata* (5), *euphorbiata* (7), *pupuraria* (2), *sacraria* (2, one taken by Mr. Rogers at Plymouth, 1858, and one from Mr. Hellens, of Exeter, bred in 1867), and others," 13/–. Lot 249, "*pinetaria* (4), *conspicuata* (5), *euphorbiata* (7), *sacraria* (2, one taken by Mr. Bouchard at Sutton, Surrey, Aug. 1864, and one from Mr. J. B. Hodgkinson, taken in Lancashire, 1864)," 20/–. Lot 250, "*pinetaria* (6), *euphorbiata* (4), *purpuraria* (3), taken by D. T. Button, Gravesend, in 1867," 9/–. It would appear, however, from these prices that *purpuraria* was not greatly in demand. Four specimens of *Aplasta ononaria*, "taken by Mr. Piffard in the Warren, Folkestone, July, 1866," were disposed of at 6/– and 14/– a couple. Six *Eupithecia consignata* and forty-eight others sold for 12/–; another lot of "pugs," including four *stevensata*, went for 9/–; but the next lot, which contained eleven *consignata* as well as four *stevensata*, found a purchaser at 27/6; and two other lots, in each of which there were five examples of *stevensata*, were knocked down at 45/– and 26/–. Two lots of *Eupithecia*, among which were several good species, including eight specimens of *extensaria* in each lot, went for 18/– and 24/. Lot 274, comprising three examples of an undetermined species of *Eupithecia* and three *innotata*, sold for 37/6. *Phibalapteryx polygrammata*, of which there were twenty specimens, were disposed of in lots of four, at from 35/– to 55/– per lot; the total sum realised for the series was £10 15s., and this gives an average of 10/9 per specimen. One hundred and ninety-four specimens of *Pyralidina*, including six *Diasemia literalis*, were disposed of for 10/–; and another lot of one hundred and twenty-six specimens, including nine *D. literalis* and eleven *Nascia cilialis*, went for 15/–. *D. ramburialis*, of which there were four specimens, sold at 10/6 a brace; and a pair of *Botys lupulinalis* produced 10/–. Another example of the last named went with a lot of other nice species for 7/–; and a fourth example, together with a hundred and one specimens of other species, sold for 15/–. Two specimens of *Antigastra catalaunalis* did not run up the price much of the respective lots in which they were included, as one with sixty-two other decent "Pyrales" went for 8/–; and the other, attended by seventy-two nice things, fetched 9/–. The same remark applies to *Margarodes unionalis*, of which there were four examples. *Botys repandalis*, discovered and bred in this country by Mr. Burney, realised from 20/– to 26/– each; there were only seven specimens in the series.—R. S.

VANESSA ATALANTA AND V. CARDUI.—With reference to Mr. Arkle's note (Entom. xxvi. 356) on *V. atalanta* in Florida, I may mention that I found this species fairly plentiful in 1887 at Charleston, S. Carolina, where the larva fed on *Lamium* (dead-nettle), which grows in marshy places. The perfect insect is somewhat smaller than the British, but when placed side by side no difference in colouring can be observed. I also found *V. cardui* at the same place, and since I have been in South Africa have met with it everywhere; it simply swarms at Johannesburg, but is somewhat smaller than the British insect, one specimen which I bred measuring $1\frac{5}{16}$ inch in expanse of wings. In the absence of its usual food-plants it feeds on a species of everlasting, which also serves as a food-plant for a cannibal Noctua. In collecting larvæ of *V. cardui*, I casually placed one of these larvæ in the breeding-cage, and in the course of two or three days was astonished at finding the latter had eaten nearly all of its companions.—Jas. P. Cregoe; Johannesburg, Jan. 5th, 1894.

Second Broods in 1893.—Seeing that several correspondents are recording unusual second broods in 1893, I append a list of those that have come under my notice. *Agrotis segetum* was common everywhere during Aug., Sept., and Oct. *A. exclamationis*, some half dozen in Suffolk during late Aug. and early Sept.; and again at Winchmore Hill on Sept. 28th and Oct. 14th, the last being perfectly fresh. A freshly-emerged female *Pieris rapæ* and its empty case were found on a fence at Crouch End on Oct. 14th, and on the same evening a specimen of *Boarmia rhomboidaria* at light, the latter a male, small, but otherwise good. At treacle at Winchmore Hill the following turned up:—*Leucania pallens* (Sept. 25th), *L. comma* (Sept. 25th, 28th, and Oct. 14th), *Triphæna orbona* (Sept. 25th, 26th, 28th, and Oct. 7th), *Caradrina morpheus* (Sept. 28th), *C. cubicularis* (Oct. 14th), *Agrotis puta* (Oct. 14th), *Xylophasia polyodon* (Oct. 18th). Besides the above, a second brood of *Acidalia incanaria* was noticed in plenty on the fences here on and about Sept. 10th.—Russell E. James; Chesterville, Hornsey Lane, Jan. 22nd, 1894.

CAPTURES AND FIELD REPORTS.

The Mild Season.—I found to-day, in a breeding-cage which has stood since October in a cellar where no fire is ever made, a freshly emerged *Dasychira pudibunda* (alive) and *Cucullia verbasci* (dead), in splendid condition. I have never had any Lepidoptera emerge before in January, although kept in the same place.—A. Jacoby; 7, Hemstall Rd., Jan. 31st.

Mr. Butler enquires (*ante*, p. 71) if Jan. 21st is not a very early date for *Hybernia leucophæaria*. Under ordinary circumstances doubtless it is so; but in this abnormally warm winter it is only natural that such species should emerge at an unusually early date. So I notice that Miss Maude Alderson records this species as being well out on Jan. 17th at Worksop (*loc. cit.*). Even in Scotland it was out at a still earlier date (Jan. 12th), when I took a single specimen at rest. This was rather remarkable, as coming so soon after the three days of intense frost which we experienced from Jan. 6th to 8th, when the thermometer readings for the three successive nights were respectively 5° above zero, 2° below zero, and 2° above zero. But the frost departed as suddenly as it had come, and was succeeded by very mild weather. Last year I took *H. leucophæaria* on Feb. 5th. Mr. Freir (*l. c.*) records the capture of *Phigalia pedaria* (*pilosaria*), as an "early occurrence," on Jan 20th. I took a specimen here (Scotland) on the 21st, and last year took one on Feb. 3rd, also in Scotland. On Jan. 22nd, a frosty night with brilliant moon, the whitethorn hedges here were full of *H. rupicapraria*, which was then out in profusion; last year I took it here on Feb. 1st. Very probably the species I record were out even earlier than the dates I give, as I did not search for them, and only came across those I found incidentally.—J. A. Mackonochie (Rev.); The Hirsel, Feb. 9th, 1894.

The following notes are from North Derbyshire, 150 miles north of London, at 500 to 600 feet elevation:—*Hybernia rupicapraria* seen Jan. 16th; *H. progemmaria* taken Feb. 5th; *Phigalia pilosaria* taken Feb. 6th; larva of *Phlogophora meticulosa* taken Oct. last, spun up same month, and emerged to-day (Feb. 7th).—K. H. Fuller; Bakewell.

I saw a male *Hybernia leucophæaria* at rest on Jan 27th, on an oak-trunk in the woods bordering the drive to Eaton Hall. Weather very mild since Dec. 3rd, excepting a week of severe frost ending Jan 8th. I took a fine male *Phigalia pedaria (pilosaria)* off a Chester gas-lamp (Curzon Park), on Dec. 29th, 1893; and the species was common on the lamps on Jan. 25th, 1894.—J. Arkle; Chester, Feb. 2nd, 1894.

Last evening I captured an example of *Phlogophora meticulosa.* The specimen, which is in good condition, was in a cool conservatory—temperature about 53°. Does this moth ever hybernate?—F. W. Freir; Elm House, Walthamstow, Jan. 23rd, 1894.

Yesterday I had a specimen of *Macroglossa stellatarum* brought to me, which was captured while flying about a room in a house at Portslade. The insect is in fairly good condition, notwithstanding its imprisonment in a match-box.—T. Willson; Hangleton Hall, Sussex, Feb. 9th, 1894.

On the evening of the 2nd inst. a friend and myself had an evening with the lantern in Epping Forest. The weather was rough, raining at times, and very mild. Searching the boughs and trunks of whitethorn and oak trees produced several *Phigalia pedaria,* and then we thoroughly examined an oak-fence with excellent results. *P. pedaria,* both male and female, were taken to the number of eighteen; they were chiefly settled on the top edges of the palings, fluttering their wings, and were easily boxed. We also captured *Scopelosoma satellitia* (one), *Hybernia progemmaria, H. defoliaria, H. leucophæaria, H. rupicapraria,* and eight chestnuts (*Cerastis vaccinii*). Altogether our captures were about forty insects, and the genus *Hybernia* simply swarmed.—F. W. Freir; Feb. 16th, 1894.

As another instance of early awakening from hybernation, I may mention that Mr. W. J. Lucas has just sent me a living specimen of *Pterophorus monodactylus* (=*pterodactylus*), which he took on the palings in Richmond Park, on the 19th inst.—Richard South; 12, Abbey Gardens, St. John's Wood, Feb. 21st, 1897.

Sugaring in January.—Tempted by the unusually mild weather, and never having tried sugar in January before, I got my tin and brush out of their winter hiding-place on the evening of the 11th inst., and went a "round." The result was a "bag" of twelve moths—nine *Scopelosoma satellitia* (some in very good condition), one *Cerastis vaccinii,* one *C. spadicea,* and one *Pterophorus monodactylus.* I also saw a small moth, which I believe to have been a *Tortrix,* on the wing, but had no net with me. It is perhaps worth mentioning that, having no rum, I put a few drops of "white rose" perfume into the sugar. I have often thought of trying this before, and I shall certainly try it again in the summer.—S. G. Reid (Capt.); Froyle House, Alton, Jan. 20th, 1894.

Larvæ of Pieris brassicæ in November.—On Sept. 23rd I found on cabbages a number of larvæ of *Pieris brassicæ,* which I placed in a breeding-cage. To save the cabbages I watched the bed daily, and up to Nov. 30th, when I left the country, I seldom missed finding some larvæ. The numbers were so great that I was obliged to destroy many of them; some hundreds changed into pupæ, which I have kept. The mildness of the autumn may have caused them to appear at such an unusual time, and may be worthy of record.—G. B. Routledge; Tarn Lodge, Wetheral, Carlisle, Dec. 1st, 1893. [Larvæ of this species were recorded as "swarming" at Dovercourt on Oct. 10th, 1892; *vide* Entom. xxv. 287.—Ed.]

A Day in Monkswood.—On July 6th, 1893, memorable in the hearts and minds of English people by the marriage of the Duke of York and Princess May of Teck, and by being the hottest day known for many years, I made a trip to that Eldorado of entomologists, Monkswood—Monkswood of *pruni* renown—in Huntingdonshire. I can almost hear many of my fellow insect-lovers exclaim, "Yes; I have often heard and read of Monkswood, but how do you get there?" The nearest station to that noted place is Abbot's Repton, a small siding, the first after passing Huntingdon. The wood itself is situated about two miles from the station; the way there is along a very pleasant winding road, with wide stretches of grass, rushes, and waste ground on each side. Immediately on leaving the station, and before I had time to fix up my net, I saw and afterwards captured a fine male *Argynnis adippe*. After journeying a short distance a passing cart gave me a friendly lift; my guide was of a very talkative disposition, and informed me that "a few years ago we used to see a lot of you gents with nets about, but they seem to have left off coming lately." On the way I noticed several *Argynnis*, *Melanargia galatea*, and other species. Arriving at the top of the hill I alighted, and, having bid my friend farewell, descended a sharp decline, and then, turning to a gate on my left, I was astonished to see *Melanargia galatea* rise before me in crowds—nay, as Newman says in his fine work on 'British Butterflies,' "in profusion." I only once before remember seeing a similar sight, and that was at Gulliford's Tree, near Dorchester, Dorset, a few years since. *Epinephele tithonus*, *E. hyperanthus*, *Hesperia sylvanus*, *H. linea*, *Chrysophanus phlœas*, *Lycæna icarus*, and other common species, were in abundance. Having captured a good series of those I required, I entered the wood. *Macroglossa stellatarum* flew rapidly by me. Here I may mention the flies came around my head in millions; having, however, a dislike to tobacco smoke, they soon bid me adieu. Many more Sphinges dashed past me, but I was unable to make a capture. Then, with its well-known aristocratic flight, *Argynnis paphia* appeared in view—that bright red patch of colour that seems to have been designed by Nature to enrich the cool grey woody shadows; and having succeeded in netting the specimen, I met an aged woodman. "Ah! yes," he exclaimed, "we calls 'em 'sogers' in these parts; if you go up the drive and turns to your left, there be lots of 'em." I went up that drive and turned to my left, and sure enough there were "lots of 'em." Arriving at the top of the wood, after a very hot, close walk, I was delighted to get *Argynnis aglaia*, a female, in grand condition; and soon *A. adippe* fell to my net. I afterwards found both kinds plentiful and in fine condition, but difficult to obtain. Later on I took some good *Pararge egeria*. Whilst quietly lunching in the shade I espied a female *Apatura iris* flying grandly round an adjacent oak tree; the bushes grew high and thick here, therefore I failed to get within reach of her. By this time my boxes were closely packed, so I bade Monkswood farewell. On my way back I netted many *E. hyperanthus*; but nothing in the form of a good variety could be found, and only one bleached specimen of *E. ianira*, a male.

I also captured one more *A. adippe*, and one *A. aglaia*, after an exciting chase. While waiting for the train I again saw *Macroglossa stellatarum*.—ALFRED H. BLAKE; High St., Biggleswade, Beds., Dec. 12th, 1893.

OBITUARY.

MAJOR-GENERAL GEORGE CARDEN died, after a few days' illness, from the effects of influenza, at Douglas Towers, Bromley, Kent, on Monday, February 12th, aged fifty-six. He entered the army in 1854 as an Ensign in the 77th Foot, and served with his regiment in the Crimean War. He subsequently served with the 5th Foot (now known as the "Northumberland Fusiliers") during the Indian Mutiny Campaign, and was Lieutenant-Colonel commanding that regiment for some years. Colonel Carden (who was granted a year's service for Lucknow, and was in receipt of a Distinguished Service Pension) retired on half-pay in 1882, and received the rank of Major-General in 1887. On retiring from the army he took up his residence at Surbiton, and remained there until he left for Bromley in 1892. He joined the Entomological Society of London in 1890. General Carden made no pretensions to be a scientific entomologist, but he was a close observer and an ardent collector of Lepidoptera; and his small collection consisted exclusively of insects obtained by himself in the woods and fields, or bred from larvæ which he had collected. During the past six years the writer of this notice made many pleasant excursions with the late George Carden in the New Forest, and Tilgate Forest; in Barnwell Wold, the Bedford Purlieus, Castor Hanglands, and other woods in Northamptonshire; and in many woods and on many hill-sides and commons in Kent, Sussex, and Surrey. In July and August, 1891, the deceased spent his annual holiday of six or seven weeks in South Devon, and obtained a long series of *Callimorpha hera*, several of which were generously presented to the writer. General Carden was a good musician, both theoretically and practically; and his voice, a light tenor of pleasant quality, will be missed in local musical societies, and also in certain "Choirs and places where they sing." He was also an accomplished artist, and lost no opportunity, when away on his entomological excursions, of sketching and painting the most picturesque scenes amongst which his rambles led him. As a man of business he did good service, from the time of his retirement from the army up to the date of his death, as Secretary of the Rochester Diocesan Society, and he will be much missed in Parliament Street. Although apparently a shy, cold, and reserved man amongst strangers, intimate acquaintance proved him to be a kind-hearted and genial companion, especially in the smoking-room; and his premature death makes a gap in a wide circle of friends which will not easily be filled up. The deceased leaves a widow and nine children. —(H. G.)

ERRATA.—P. 36, line 4, for "*Melitæa*" read "*Melanargia*." P. 62, line 2 from bottom, for "account for those" read "account for *in* those."

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THE GENERA OF LIMNAINE RHOPALOCERA ALLIED TO *CADUGA*, AND DESCRIPTION OF A NEW SPECIES.

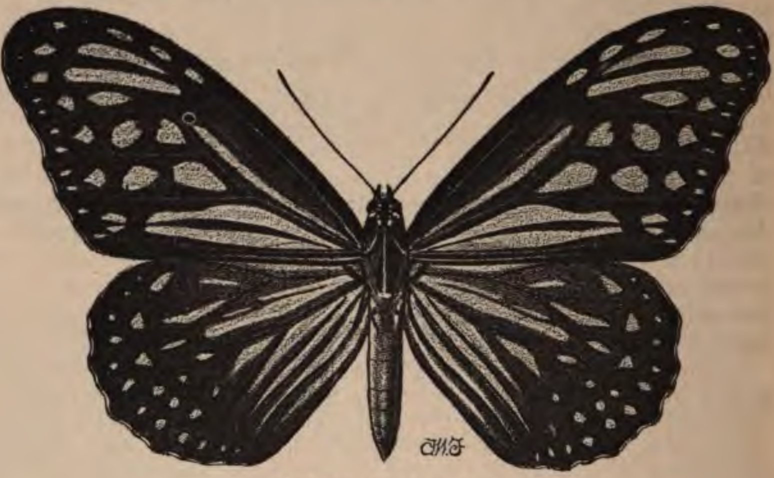
By J. JENNER WEIR, F.L.S, F.E.S., &c.

THE genus *Caduga*, Moore, with the three genera *Mangalisa*, Moore (type *albata*, Link. Som.), *Budacara*, Moore (type, *nilgiriensis*, Moore), *Chittara*, Moore (type *fumata*, Butler), form a very natural group, differing mainly from the allied genus *Parantica*, Moore, by their more robust structure and greater substance of the wing; in the latter genus the wings have a much more flimsy character, and all the species a far more slender appearance.

The genus *Caduga* itself may be divided into two sections: the first has the characteristic white markings broad and hyaline, being but little interrupted by basal lines, excepting somewhat in *C. pseudomelaneus*; this section consists of *C. tytia*, Gray, and the closely allied topomorphic races, *C. niphonica*, Moore, and *C. loochooana*, Moore, *C. tytioides*, De Nic., *C. melaneus*, Cramer, and its topomorphic race *C. swinhoei*, Moore, and the rare but perfectly distinct *C. pseudomelaneus*; the other section is characterised by having all the white markings much reduced in breadth, scarcely hyaline, with the white in the discoidal cells of both wings and the lower basal markings of the fore wings much broken up by lines proceeding from the base, and dividing each marking into two or more: this section consists of *C. larissa*, Felder, of Java; *C. banksii*, Moore, of Malacca and Sumatra; *C. luzonensis*, Felder, of the Philippines; *C. funeralis*, Butler, which I place here with doubt, from Nias; and, lastly, *C. crowleyi*, from Kina Balu, North Borneo, the subject of this paper.

CADUGA CROWLEYI, n. s.

This fine species, as will be seen by the figure, is nearly allied to *C. larissa* and *C. banksii*; it differs from either of those in form by the more triangular shape of the fore wing, which is also much broader and more rounded at the apex; the subhyaline mark in the cell is reduced to a slender streak of white, with a just visible second streak above, quite obsolete towards the base; the lower basal markings are more completely divided than in either of its allies.



Caduga crowleyi, n. s.

The lower wing has the streak of white in the cell very long and narrow, with a much narrower white line above it, and between the two there is—towards the distal end of the cell—a third just visible streak; below are four basal streaks; there are three spots above and four below the cell on the disk; beyond is a double row of submarginal white spots, which are better defined than in any other species of the genus. The fore wings have an expanse of 100 mm., thus exceeding in length most specimens of either *C. tytia* or *C. melaneus*, but falling short of the dimensions often reached by those two species.

Hab. Kina Balu, North Borneo.

I am indebted to Mr. P. Crowley for this valuable addition to my collection of Limnainæ.

THE NEW ENTOMOLOGY.

By W. E. Sharp.

(Concluded from p. 88.)

The distribution of insect life, again, is a subject to which attention has been paid only recently. Here we get into touch with Geology and Palæontology; we explain, to our own satisfaction at any rate, the occurrence of mountain and lowland forms. We have our theories of waves of migration, of older and newer arrivals. When we discover *Dytiscus lapponicus* in a highland loch, and *Pachnobia hyperborea* on a highland mountain, *we* are not simply content with those facts, we must enquire more curiously; we appeal to the Geologist to interpret our phenomena, and the Geologist—on the strictest lines of inductive reasoning—tells us of long past ages of ice, when glaciers slid down the sides of our highland mountain and scooped out the bed of our highland tarn: the Palæontologist takes up the tale, and speaks of fauna and flora specialized to such Arctic conditions. Thus we get hold of the idea of vast secular changes of climate, and of plants and insects gradually changing with changing conditions of temperature and environment; of our Alpine forms being, as it were, the stranded relics of an older world; and Entomology takes its place among the other sciences to tell us of the ever-changing procession of life which has been marching across this planet since vitality first began upon its surface.

Another development of modern Entomology, although this is to a great extent the work of the future, is some investigation into that difficult problem of the irregular abundance and scarcity of many forms of insect life. That there are factors at work all through Nature of which we know little or nothing, influences which guide the ebb and flow of being, we are perhaps only now beginning to learn. To me this field appears to be one of the most interesting and one of the most fruitful that can engage the attention of the modern entomologist, but I foresee that it must be approached by the most strictly scientific methods. I believe that there are subtle correlations and delicate adjustments between various forms, and between form and environment, that elude our most patient research; and perhaps I may be allowed in this connection to depart for a moment from my retrospective attitude, and to impress upon my readers the incalculable value, in this matter, of careful systematic records kept by a competent body of observers during a long period of time. I venture to believe that this subject has an economic bearing and importance little suspected, while its true solution would throw light on some of the most mysterious phenomena of Biology.

That, however, is one of the tasks of the future, and I am now discussing more the present position of Entomology. Let us, then, consider for a moment one comparatively modern department of the study from a biological point of view. I have already alluded to the support which many post-Darwinian evolutionists have been able to derive from a study of the order Insecta. I need only mention *mimicry*, as it is called, to instance one case. We all know what is meant by mimicry, and how its practice was first discovered actively at work in the economy of Nature among certain groups of Lepidoptera in South America. Since then, however, we have included mimicry in a wider term, and call it only one form of assimilative coloration. Now it is quite certain that in the realms of Entomology we meet with by far the most striking instances of protective resemblance, both in colour and form. Formerly this principle was supposed to be generally tropical in its manifestations, and it was thought sufficient to cite as instances the Heliconid imitative Pieridæ of Brazil or the stick-like Mantidæ of India. Now we know that this specialization of colour and form pervades all Nature, and is as common, although not so theatrical in its developments, in Europe as under the Equator. We, moreover, distinguish between its manifestations; there is the defensive and the aggressive kind; there is the simply passively protective, as in the case of Geometrid larvæ or the majority of our British Rhyncophorous Coleoptera; or actively defensive and minatory, as the wasp beetle, or the larva of *Chœrocampa elpenor*. Of this protective kind of resemblance there is a perfect cloud of witnesses among insects. Protection by colour for aggressive purposes or concealment for attack seems less frequent; but there are many instances of it, both in its concealing and alluring phases, among the Arachnida. Some assimilative coloration also serves a double purpose, as in many of the Hydradephaga (the water beetles), and conceals the insect as well from the perch, its enemy, as from the smaller beetle, its prey.

This is a very wide and a deeply interesting line of research; and I have dwelt upon it for a moment, familiar as it is to all of us, because it exhibits examples not only of some of the best evidence supplied by Entomology in support of evolution, but also of some of the most serious difficulties that theory has had to contend against. For it must by no means be assumed that because the evolutionary theory of life has found a general acceptance among all modern scientific thinkers, that therefore it can solve all problems that Biology can offer to it. The courses of most great theories have similar features. A great mind evolves and enunciates some luminous generalization; it explains so much that the vast illogical, inaccurate, public fancies that it explains all, and it meets with a triumphant acceptance. Then the wise men, generally German professors, turn and seek to rend it, dissect its premises, prove it with hard questions, follow its deductions to their remotest conclusions, and find perhaps that some of its assumptions are too hasty, some of its supporting evidence feeble or irrelevant, and the real battle begins. Sometimes the great theory falls incontinently to pieces, like that of the Aryan race and their Asiatic home; far more rarely, like that of the Copernican system of the heavens, it emerges triumphant from every ordeal, and becomes thenceforth axiomatic.

Thus has the evolutionary idea of life been assailed, and more especially with Entomological arms. For instance, although we may cite mimicry as a most cogent evidence of modification of form or colour by the pressure of the environment, and indeed believe that there can be no other tenable theory to explain its manifestation; yet when we come to consider the method of change, step by step, we feel almost crushed by a sense of the impossibility of a rational explanation of the *modus operandi*. A *Pieris* could only obtain protection by its resemblance to a *Heliconia* when that resemblance had become approximately perfected; but what started the development along that particular line, and what carried it on? We must necessarily believe the change to have been very gradual, a few scales at a time, and in many generations. How was it then, if the species needed that protection for its very existence, that it was not exterminated before it had time to arrive at that pitch of resemblance which alone could afford the necessary protection? You perceive the difficulty, and this is only one of a thousand which the entomologist can ask.

Thus most of my readers will be aware that the pages of one of the "serious" reviews have lately been the arena for an encounter of the greatest interest and moment between two of the most eminent of living Biologists. I refer to Mr. Herbert Spencer and Professor Weismann. Their weapons are taken almost exclusively from the entomological armoury; and the Sphinx-like riddle on which the Englishman attempts to impale his adversary is something like this.

If, as you contend, all specialized forms are the result of the pressure of the environment acting through heredity, and further, if acquired variations are not transmitted, how do you explain the very specialized forms of worker ants and bees? For not only is each species clearly differentiated from the rest, but these workers, so differentiated, are themselves structurally distinct from the males and fertile females of the same species. Yet the workers or neuters, being sterile, cannot transmit beneficial variation, and the environment which justifies such variation in the workers has no application to the males and perfect females which do transmit.

The difficulty is not a new one, but the question is one of the many which are much easier to ask than to answer. How the German Professor replies, and how his opponent rejoins, and what are the arguments they employ, with these I will not further weary you, for whoso will may read them in the pages of the 'Contemporary.' I have indeed only referred to all this to demonstrate how Entomology is not now merely the innocent hobby of a few mild enthusiasts, but has become the necessary equipment of the modern scientific Biologist.

Perhaps I ought to add, as a further department of the new

Entomology, that economic form of it which is so conspicuous in America, and is yearly attaining larger proportions with us. My view of the case, however, is that this is no part of the scientific extension of Entomology. The study of chemical manures and soil constituents is no part of Chemistry; it belongs to the modern method of Agriculture. And what we call economic Entomology is also really a department of Agriculture, and would not be worth the trouble of studying except for the sake of agriculture. This I do not say in any sense of depreciation of the labours of the many workers in that field—workers who have done, and are doing, most excellent and valuable work. The application and diffusion of special knowledge gained by special research is one thing, and a very necessary one; but the attainment of ultimate truth is quite another, and this only can worthily be called Science.

You observe how I harp on that word *Science*, for my endeavour to-night has been to indicate in some slight way the *scientific* side of our favourite study; how we take part in the general progress of knowledge, and have our share in the great physical controversies of the failing century. I have sometimes heard it asserted that Nature has lost half her charm since we have taken to subjecting her to the methods of exact investigation, materialised and dead are the epithets descriptive of her condition, the glamour faded, the enchantment broken. My mind on the subject is different; I think, even in the study of insects, we find an added fascination and a deeper meaning as we look at them in the light of modern research; we have that sense of something far more deeply interfused, that idea of the mystery which underlies all phenomena, the reality behind the mere transient and apparent when we transcend the method and begin to enquire about the cause,—a mystery and a reality which to the simpler vision of our predecessors was undiscernible.

For we ourselves are heirs of all the ages, and our sciences after a certain point become mutually interdependent and correlatives of one another. To know one part of Nature thoroughly the student must be conversant to some extent with all her manifestations. He who would be a specialist in Entomology must seek the help, if not share the labours, of the botanist, the geologist, the palæontologist, even of the physicist and the chemist. Who is sufficient for these things? you may well ask; and consequently, although many may be called to be entomologists, few are chosen to interpret the secrets of insect Biology. For there are now, as ever, entomologists of all kinds, and, even ignoring the schoolboy and "young collector" stage, many call themselves entomologists whose only claim to the title is a zeal for acquisition which they share with the bibliomaniac and the philatelist. A collector of insects need not necessarily be an entomologist, although the terms seem too commonly held as synonymous. To pursue this line of thought much further might lead us to a consideration of that commercial kind of Entomology which is certainly a new departure, and not always a pleasing one.

I must, however, restrict myself to my original argument, and my belief is that as Entomology has enlarged her borders, annexed new fields of speculation, and discovered possibilities previously unthought of, so her votaries have become more serious; and if, on the one hand, we may discern a tendency for the study—at any rate of the Lepidoptera—to become fashionable, and perhaps superficially popular, on the other we have as adherents men eminent in biological science, men whose names are familiar to you all, whose work and whose influence are alone sufficient to redeem Entomology from the charge of triviality or lack of adequate intellectual interest.

So much for the *present* position of the study. And the future? Well, as I said before, the time is past when the work of the future was supposed to be simply the description and enumeration and systematic arrangement of all the species of the Order Insecta now extant on this earth; we have other ideals. In a book which has lately attracted much attention, which attempts a forecast of the goal whither our present social and intellectual tendencies are urging us, the author indicates his belief that the future of natural science is towards specialism. The possibilities of great revolutionary theories will soon be exhausted; they must be attacked and defended in detail; the sciences are yearly becoming more comprehensive and more profound, and individual work, this author believes, must necessarily become more departmental and circumscribed. And I think you will consider the forecast a just one; the tendency undoubtedly *is* towards detail and subdivision. The autocrat's "scaribee" was a prototype. First we had Naturalists, Ray and Linnæus; then came Entomologists, and we still call ourselves by that name, although there are really hardly any Entomologists now extant. We are Lepidopterists, Coleopterists, Hemipterists, and the like. Already we may notice a tendency to further subdivision, and probably the next century may know us as "Aphodiists," "Vanessidists," or the exhaustive investigators and recorders of some extremely limited local insect fauna. I fancy, too, that our studies may become more interesting as they take a lateral rather than a vertical extension; for instance, that as facilities for exchange and intercommunication become enlarged, it will be preferable to collect and study, say, the Elateridæ or the Theclæ of the world rather than the Coleoptera or Lepidoptera of Great Britain. Specialists *in petto*, to have mastered a small part thoroughly, that will perhaps be the laudable ambition of the entomologist of the future, and to the vast edifice of the sum of human knowledge we shall be content if we have added but one single and inconspicuous stone.

And this brings us to our final standpoint. In my inability to pursue the more accustomed path of the annual addresses, and review for you the notabilia of the entomological year, I fear I have been betrayed into an erratic course among vain retrospections and useless speculations. It is, however, profitable sometimes to stand back as it were, and view a matter or a study in which one is continually interested as a whole, and in the due perspective of a common intellectual atmosphere, and my purpose to-night has been to do this, and to show that the study for which our Society exists, besides being an anodyne for, and a refuge from, the increasing strain and stress of our necessary daily work, is also a science, and, as a science, is concerned with the constant and ineffable mystery of organic life.

NOTES ON CORSICAN BUTTERFLIES.

By William E. Nicholson, F.E.S.

Mr. Standen has already given an excellent account of his experiences in collecting in Corsica (Entom. xxvi. pp. 236–238 and 259–263), and, although I visited the island a month later, I have but little to add thereto. Some of the species, such as *Argynnis eliza* and *Satyrus neomiris*, which were rare at the time of his visit, occurred in considerable abundance later on, while *A. paphia* var. *anargyra* was in profusion. It is not my intention, however, to give any further account of collecting in the island, but merely to draw attention to some of the interesting problems presented by its butterfly fauna.

Corsica, although like England, belonging to Mr. Wallace's class of recent continental islands, presents a very much larger amount of differentiation, and its isolation must be of far greater antiquity. A map of Pleistocene Europe, given in Mr. Boyd Dawkins' 'Early Man in Britain,' shows Corsica and Sardinia united to the mainland of Italy in the direction of the islands of Capraja and Elba. The greater part of the sea in this direction is within the 100-fathom line, though there are some deeper channels within the 500-fathom line. I am, however, inclined to think that isolation must have taken place rather early in this period to account for some of the phenomena that the fauna presents.

One of the most striking features of the fauna is the absence, notwithstanding the fact that the island is almost entirely mountainous, with some peaks over 8000 feet high, of any of the strictly alpine species of the mainland. Among the most conspicuous absentees are the genus *Parnassius*, *Colias palæno*, and *C. phicomone*; the alpine blues, such as *Lycæna pheretes*, *L. eros*, and *L. orbitulus*, Lycænidæ generally being very poorly represented; the genus *Melitæa*, though represented by at least a dozen species on the mainland; and, most striking of all, the genus *Erebia*, though upwards of twenty species occur in Switzerland and South Eastern France. I was at first very puzzled to account for the complete absence of all mountain butterflies; and the only explanation that I can offer is, that the island was isolated from the mainland before the increasing cold in the arctic regions, which was to culminate in a glacial epoch for Europe, had driven the species which now inhabit the alps of Europe from the circumpolar region, whence they probably originated. From the number of genera common to the palæarctic and nearctic regions, the greater part of the European fauna appears to have been of circumpolar origin; but probably a very much less degree of cold would have sufficed to drive many of the species south, those which are at present found only in the mountains of Europe being the last to retreat before it. Considerable traces of local glaciation exist in the island itself, as the presence of alpine tarns in rock basins under the steep cliffs near the summits of the higher peaks, such as the Monte Rotondo and the Monte d'Oro, and the smooth rounded surfaces presented by the higher slopes of the mountains; but there is nothing to show that the glaciers were of any extent, and, as pointed out by Mr. Wallace in a recent article in the 'Fortnightly,' no lake basins occur in the island in the lower valleys. The cold, however, may have been sufficiently intense to have destroyed any species of the Eur-African fauna which may have inhabited the island. The only African butterfly at present found there is *Charaxes jasius*, which is also found in the South of France. I gathered from a French Coleopterist that there was a certain proportion of African forms among the beetles.

The entire absence of alpine butterflies is but one of the features of interest that the fauna presents, and probably nowhere so close at hand can the gradation from species identical with those on the mainland "through slight varieties, local forms and insular races to well-defined species," to use Mr. Wallace's words, be so well studied.

The same remarks apply, of course, to the sister island of Sardinia, from which the isolation must be comparatively recent, as the straits of Bonifazio are only ten miles across at the present time. I have not, however, been able to obtain a Corsican record of *Epinephele nurag*, which may possibly be confined to Sardinia. It appears to be rare in collections, and was described by Ghiliani from Sardinian specimens.

Slight variation is exhibited by a number of species found in the island, and many of these are noted by Mr. Standen, e. g., *Lycæna baton*, *L. astrarche*, *Vanessa c-album*, and *Epinephele ianira*, to which might be added *Argynnis paphia* var. *anargyra*, which, although not peculiar to the island, is, I believe, more abundant there than on the mainland, and tends to wholly replace the type.

Among the species presenting what may be considered local forms may be classed *Polyommatus phlœas* and *Lycæna ægon* var. *corsica*. The *P. phlœas* are mentioned by Mr. Standen as belonging to the form *eleus*, and no doubt they are close to this form. They do not, however, exhibit the tails quite so conspicuously as the true *eleus*, and they are considerably blacker than any *eleus* that I possess. Moreover, they do not appear to be temperature forms like *eleus*, but rather to be a well-marked local race. They occur throughout the season, and at various altitudes. The majority of my own specimens came from the slopes of the Pointe Ceppo, just above Vizzavona, where the mean temperature would be decidedly below that of the South of England. *L. ægon* var. *corsica* has been exhibited by Mr. Jones to the Entomological Society. The female of this variety is beautifully shot with blue, and the spots on the under side vary considerably. In the majority of specimens they are large and pale.

There are five well-marked examples of insular races, viz., *Euchloë tagis* var. *insularis*, *Vanessa urticæ* var. *ichnusa*, *Satyrus semele* var. *aristæus*, *Pararge megæra* var. *tigelius*, and *Syrichthus sao* var. *therapne*. *E. tagis* var. *insularis* is an insular race of a species which varies considerably on the mainland, the var. *bellezina* found in the south-east of France being intermediate between this variety and the type as found in Spain. *Vanessa urticæ* var. *ichnusa* is evidently a nascent species. It would appear to be single-brooded, though the larvæ resulting from the hybernating females may be found over a considerable period. It chiefly frequents the mountainous parts of the island, and a number of specimens were noticed disporting themselves on the summit of the Monte d'Oro, at nearly 8000 feet. The inner marginal spot on the fore wings is occasionally quite well developed, and faint traces of the central spots are sometimes visible, either the result of reversion or of an occasional cross with an immigrant from the mainland. As pointed out by Lang, this variety is quite distinct from the so-called *ichnusa* occasionally bred in England, being much less angular in outline than the type. It is curious that an intermediate form, the var. *turcica*, should be found in the Balkans and Asia Minor. *Satyrus semele* var. *aristæus* is very distinct from the type. The fore wings are more fulvous, and the female has three small white dots near the margin of the hind wing, which occasionally occur in the type, but are more usual in this variety. M. Mabille considers it a distinct species, and says that "the larva presents constant differences, and never varies itself." A study of Corsican forms, however, renders one's conceptions of a species very indefinite. The specimen figured by Lang hardly represents the specimens I captured at Corte, which, although brightly marked, are scarcely larger than the English form. This variety is stated by Lang to occur also in Sicily, which is strange if it is a form differentiated by isolation, as Sicily does not appear to have been joined to Corsica in recent geological time otherwise than by the mainland of Italy. *Pararge megæra* var. *tigelius* is considerably smaller than the type, and the darker markings are not so pronounced. Southern *Megæra* have, however, the same tendencies on the mainland, and I possess somewhat similar forms from Malta. *Syrichthus sao* var. *therapne* is a very distinct form of a species which is rather more constant than most of its congeners on the mainland. It is considerably smaller than the type, and the white spots have a yellowish tinge. Like other purely Corsican butterflies, it has a wide range in the island, occurring at the sea-level near Ajaccio, and at an elevation of over 4000 feet near Vizzavona.

The well-defined species peculiar to the island, in common with Sardinia, are *Papilio hospiton*, *Argynnis eliza*, *Satyrus neomiris*, *Epinephele nurag*, and *Cœnonympha corinna*. Some of these, though perfectly distinct, have a rather close affinity with species occurring on the mainland. The best known of them, *P. hospiton*, clearly has affinities with *P. machaon*, and, from its more dusky appearance and less definite markings, it might be the older form. It must, however, be quite distinct at the present time, as *P. machaon* is not uncommon in the island, often frequenting the same banks, and I never heard of the capture of a hybrid. If really the representative of a form from which *P. machaon* may have sprung, it must have been isolated at a very remote time, and *P. machaon* must have subsequently obtained a footing in the island. Several larvæ were found in July on *Peucedanum paniculatum*; they are paler than those of *P. machaon*, and are said by M. Géné, quoted by Lang, to be spiny. In the early stages they certainly are spiny, in common with those of *P. machaon*; but they gradually lose their spines on their different ecdyses, and the adult larvæ are quite smooth. *Argynnis eliza* and *Satyrus neomiris* are not so closely allied to any continental species. As pointed out by Lang, *A. eliza* is probably nearer to *A. niobe* or *A. adippe* than to *A. aglaia*, to which the greenish ground colour of the under side of the hind wings lends it a superficial resemblance. *S. neomiris* has its nearest congener in *S. arethusa* on the mainland—an affinity better seen in the females of the two species, as indeed is usual with allied species. It is, however, quite distinct, and varies (especially in the light band on the fore wings of the male) very considerably in itself. *Epinephele nurag* has already been noted as possibly not occurring in Corsica; its nearest congener on the mainland is probably *E. lycaon*. *Cœnonympha corinna* was by far the commonest butterfly near Vizzavona, occurring up to an altitude of about 6000 feet on the Monte d'Oro. Its nearest ally on the Continent would appear to be *C. dorus*, which has very similar habits. It appears, unlike *C. dorus*, as far as my experience with that insect goes, to have a succession of broods throughout the summer, and the later broods are much darker than the earlier ones. It is stated by Lang to occur in Sicily, and, on the authority of Boisduval, in Calabria. Should this be the case, it is of course only a species having rather a limited distribution. It would, however, be interesting to compare the Corsican forms with those from the mainland. In Hofmann's 'Schmetterlinge Europas' Corsica and Sardinia are the only localities given for the species.

Lewes, Feb. 22nd, 1894.

CALLIMORPHA HERA IN SOUTH DEVON.

By E. F. Studd.

This insect is undoubtedly now naturalised in South Devon, whatever may have been the history of its original introduction. The 'Entomologist' contains numerous records of its capture in this neighbourhood, and within the last three years the Rev. C. F. Benthall, an ardent entomologist, has come to reside at Cofton, a village between Starcross and Dawlish, in the centre of its haunts. The very first summer of his residence there he captured several, and has done so each year since, his garden being a favourite locality. The fact that directly an observant entomologist settled and worked in the district, he took the insect in considerable numbers, and also found the larvæ, nearly full fed, in his garden, suggests the possibility that it may have been there from time immemorial, and only required to be regularly worked for to be taken. The fact that, without being specially worked for, isolated specimens were from time to time unexpectedly taken, over a long series of years, in the neighbourhood of, and even at some considerable distance from, its present known centre, points in the same direction. Add to this that that centre was not known as such, and is not a place likely to be pitched on by a casual entomologist, unless specially directed there, and the possibility becomes a probability.

In the year 1892 Mr. Benthall captured, or had brought to him by the villagers, thirteen specimens, including four of the var. *lutescens*. From a female, taken in that year on Sept. 12th, he obtained a batch of eggs, laid on the 14th. These hatched on the 22nd and 23rd, and on Oct. 5th he very kindly presented me with ten of the small larvæ, from which the following notes were made:—

On that date they were slightly under one-eighth of an inch long, and, viewed with the naked eye, were almost exactly like the young larvæ of *Arctia villica*, except for the slightly ringed appearance hereinafter mentioned; in fact, I find that, with that exception, I have in my note-book, describing the larvæ of each species independently, made use of practically the same words. They were then—*viz.*, at twelve to thirteen days old—of a greenish greyish yellow, with darkish hairs, and they had a suggestion, but no more, of being slightly ringed. They usually lay straight out, but if touched at once rolled into a ball. I fed them at first on dandelion leaves and borage; but after about a week, finding that they preferred dandelion, I supplied them with leaves of that plant alone.

On Oct. 10th they commenced to moult for the first time, finishing about the 13th, and I lost one, which died during the process. On Oct. 27th they commenced their second moult, finishing about Oct. 30th. On the last-named date their length was about three-sixteenths of an inch, and they were slightly darker than before, the body being a dark greyish brown, with what appeared to be a broad medio-dorsal band of bronzy yellow. On Nov. 10th they commenced their third moult, and had all finished by the 15th except one, which remained very small. By Nov. 22nd, however, this small one had fed up to the size of the others, so I assume it must have moulted in the meantime, unnoticed by me. On Nov. 15th their average length was rather over a quarter of an inch; sides dark brown, almost black, with a bright coppery dorsal band, with two white spots on each segment. The belly, prolegs and claspers were mouse-coloured, and they were covered with dark bristly hairs.

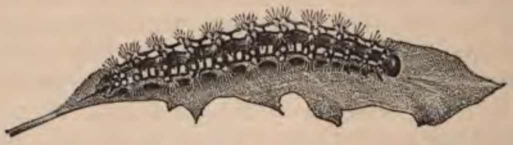
From this third moult until Dec. 3rd they did not seem to move or feed, but appeared to be hybernating. On Dec. 3rd all but two seemed to wake up, and recommenced to feed. By Dec. 15th all but the two were about three-eighths of an inch long. On Dec. 16th one of the small ones recommenced to feed, and on Jan. 1st the remaining one did so. By Jan. 18th this last was slightly larger than the others, which had apparently shrunk, having had the appearance of hybernating for some little time. On Jan. 20th, the frost having just broken up and the weather being very mild, some of them recommenced feeding, and during the night of Jan. 21–22 one moulted for the fourth time, and by Feb. 6th they had all done so. During the night of Feb. 11–12th one moulted for the fifth time, and up to Feb. 26th six had done so, Those which had moulted were much lighter and brighter than those which had not, and grew very rapidly, the largest being then about three-quarters of an inch long. Behind the white spots on each segment two fulvous brown blotches had appeared, one above the other in a slanting direction.

On March 1st the largest was just under one inch long, and during the night of March 8–9th it moulted for the sixth and last time. On March 12th this one was an inch and a quarter long, and on the 19th an inch and five-eighths. On April 17th it commenced to spin threads on the muslin cover of its box, but languished, and by May 1st was unmistakably dead.

By April 13th all the remaining larvæ except one, which had died, had moulted for the sixth time, and I was able to preserve a full-grown one.

The following is an exact description of the larva after its final change, made from living specimens. The previous descriptions have merely been to give the general appearance as they would strike a casual observer at the different ages, the markings of the full-fed larvæ, though probably all present clearly enough in its earlier stages if viewed through a powerful magnifying-glass, not being clearly visible to the naked eye.

The larva after its final change is about an inch and a quarter long, increasing to an inch and five-eighths when full-fed. It is almost cylindrical, tapering slightly from the centre both ways, towards the head and anal segment. The head, as Newman observes (Entom. vi. p. 34), is black and glabrous, and narrower than the second segment. It is also, as he says, distinctly notched on the crown, and with convex cheeks. The legs, like the head, are shining black. The back is black, and is marked on each segment with a cluster of warts. The cluster extends the whole breadth of the back and length of each segment, meeting the similar clusters on the adjoining segments, and so giving the appearance of a ragged dorsal band in the young larvæ. The upper part of the sides is black; the lower portion and the belly, prolegs, and claspers mouse-colour tinged with lilac, the prolegs and claspers being streaked with fulvous-brown markings. On each segment, in a line with the spiracles, are white marks with a lemon tinge and a slight indication of a black border to them, one towards the front of each segment and one towards the rear, and four fulvous-brown warts one below the other. From the warts on back and sides spring tufts of light fulvous-brown bristles. The spiracles, nine in number, are black. The claspers are stretched out behind when at rest, and the larva generally lies perfectly straight out, but if touched at once rolls into a ball.



The accompanying drawing, made from a living specimen, for which I am indebted to Mrs. Benthall, gives an admirable sentation of the general appearance of the larva.

When full-fed the larva spins a white semi-transparent web of threads strained very tight, looking much like an inverted tent, and in it, as in a cradle, changes, in from a week to ten days, to a reddish brown shining pupa, about three-fourths of an nch long.

My first larva to pupate sucessfully was on May 18th, when two turned. Another pupated on June 15th, but the remainder, after spinning up, wasted away and died. Of those which pupated on May 18th one died shortly after, and the other emerged some time between the mornings of June 16th and 17th. I was away from early morning till late at night on the 16th, on a collecting expedition, and unfortunately did not look at my pupæ till the morning of the 17th, and therefore am unable to say whether the imago emerged during the day or night. When I found it, it was banging about, and unhappily had slightly chipped one of its wings.

On the morning of July 5th I found that the remaining one, which had pupated on June 15th, had emerged during the night or early morning. It, too, was banging about, but had luckily not injured itself. Both these specimens are typical, but in each case the hind wings are slightly puckered, the right more than the left.

Mr. Benthall informs me that from the remainder of the eggs referred to, providing in all about sixty larvæ, exclusive of the ten he gave to me, he succeeded in rearing seven, including two of var. *lutescens*. I saw his larvæ some time in April, when they seemed in about the same stage as mine, He kept them in a heated greenhouse, feeding on dandelion leaves, and, probably owing to the greater heat, those he bred had not the puckered hind wings which mine had, and which seem usual in bred specimens, as noted by Mr. Robinson ('Entom. Record,' iv. p. 243). Mine were reared in my study, which was kept at the ordinary temperature of a living room, and they were not near the fire. After they pupated I sprinkled the webs occasionally with tepid water.

Mr. Benthall assures me that he found the larvæ cannibals, especially if kept short of food. I did not myself observe this, but mine were constantly supplied with plenty of fresh leaves. His experience, contrary to that of Mr. Robinson (*l. c.*), is that the var. *lutescens* is much rarer than the typical scarlet form, and though he has taken them of all shades of yellow, and once, as he tells me, saw one of a milky white colour (which unfortunately he failed to capture), he has not seen any orange ones.

Oxton, Exeter, Jan., 1894.

Since writing the above I have submitted it to Mr. Benthall, and his observations entirely agree with mine, with the following exception, which I think it best to give in his own words. He writes:—"Mine pupated *under ground*, forming a slight earthen cocoon. The only pupa I have got in a natural state was also in an earthen cocoon, between the branches of a dandelion root, which I had cut about two inches below the surface and one inch below the junction. This emerged, but was crumpled a little."

I was moving about a good deal while breeding mine, and as I wished to take them about with me for the purpose of observation, I was unable to keep them supplied with earth. Is it usual for larvæ, whose nature it is to pupate under ground, to spin webs and pupate in them if they have no earth?

Feb. 2nd, 1894.

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. de Vismes Kane, M.A., M.R.I.A., F.E.S.

(Continued from p. 44.)

CYMATOPHORIDÆ.

Thyatira derasa, *L.* — This widely-spread insect, though found in almost every suitable locality, occurs in but comparatively few places in abundance. Nowhere in Ireland have I found it in such swarms as occasionally I have seen of *T. batis*. It chiefly affects wooded districts in the lowlands, whereas *batis* is to be found in mountain glens at considerable altitudes. The following localities do not in any way exhibit its wide distribution, but show a varied selection of shore and inland:—

It is fairly abundant in Galway, at Clonbrock and Castle Taylor; at Drumreaske, Co. Monaghan; near Kenmare and Killarney, Co. Kerry; Killynon and elsewhere in Westmeath; and in parts of the Co. Wicklow. Only occasionally found at Knocknarea, Sligo (*R.*); Derry (*W. E. H.*); Renvyle, Connemara, Co. Galway; Favour Royal, Tyrone; Farnham, Co. Cavan; Cromlyn (*Mrs. B.*), Westmeath; Killiney, Kingstown, and Howth, Co. Dublin; near Banagher, and Toberdaly, King's Co.

Thyatira batis, *L.*—Equally widely distributed as the last species in woodlands, but, though only of occasional occurrence in some districts, it occasionally appears in great numbers. On the wooded shores of L. Gill, Co. Sligo, I have seen it in clouds at sugar; also on the shores of L. Oughter, near Killeshandra, Co. Cavan; and it is very common at Clonbrock, Co. Galway. In mountain glens, in Kerry and elsewhere, I have met with it in great abundance, and as persistent and troublesome as *Xylophasia monoglypha*, though usually it is rather skittish and shy when occurring singly. Some examples, apparently quite fresh specimens, have very little pink in the spots. The trivial aberration *juncta* of Tutt occasionally occurs.

Cymatophora or, *Fb.*—Very local and rare. All the Irish specimens I have seen are characterised by, (*a*), absence of rose or purple tint; (*b*), ground colour of a paler grey than the generality of British specimens, a trait notable also in Irish *C. duplaris;* (*c*), stigmata inconspicuous, not being thrown into relief by a fuscous ground colour, as in most Scotch and English specimens; (*d*), the fasciæ on either side of the stigmata are strongly marked. The above description, however, is written from examples from five Irish localities only, the one from Clonbrock having a darker ground than the rest. One example is of so distinct a character that I think the aberration worthy of a name. It is of a female from Farnham, Co. Cavan, and displays the most extreme of the above characters, the ground colour being pearly white, almost obliterating all traces of the stigmata, and the fasciæ are formed of very broad and almost black lines. One other similar example, from Scotland, I was shown some years ago, in Mr. Grigg's cabinet, at Bristol. I propose to designate it as ab. *gaëlica*, to indicate the two countries in which the specimens have occurred.

In comparing the Irish form with those of Great Britain, I am in some difficulty, as Mr. Tutt, with his extensive knowledge of the subject, mentions that out of a long range of British specimens he has very few that are not tinged with rose-colour; and again, that the Scottish insects are of a paler ground colour than the Kentish, and presumably those of Southern England generally. See the description of var. *scotica* in 'British Noctuæ.' I must accept this dictum as generally correct, but will add that the Irish *C. or* has a paler ground than Mr. Tutt's Scottish series, or those from Sutherland and the I. of Lewes in Mr. Adkin's fine collection. Also that Mr. Adkin's series from Darenth Wood approximate more nearly to our form, both in the absence of rose tinting and in the grey ground. I have bred specimens from Epping Forest without any rosy tinge, but, as Mr. Tutt describes, very dingy, one being so brown and devoid of markings that it would have been difficult to identify if it had been a single specimen. Dr. Buchanan White writes (*in litt.*), "I have none with a white central band. Ground colour rather dark. I have no English or Irish examples to compare with, but the one French specimen I possess is browner and more unicolorous than my Scottish series."

Localities: Markree Castle, and several at Rockwood, L. Gill, Co. Sligo, where Mr. Russ also took the larvæ on an aspen; Powerscourt, Co. Wicklow (*Greene*), one specimen; one ditto Derry (*C.*); and ditto Clonbrock (*R. E. D.*), of dingy brownish grey ground colour, like the English form, fasciæ not dark but well-defined.

Ab. *gaëlica.* Farnham, Co. Cavan, one female specimen.

Cymatophora duplaris, *L.*, *var.* argentea, *Tutt.*—The almost unicolorous Linnean type does not occur to my knowledge in Ireland. Irish examples, from which Mr. Tutt described this variety, are all of a silvery grey colour, but the transverse bands vary much in width and in depth of tone, being sometimes only slightly represented by a shading of dirty grey. The most brilliant specimen I have ever seen was taken at Drumreaske, Co. Monaghan, and was almost white and black when freshly taken, and is comparable to the ab. *gaëlica* of *C. or* in the trenchant contrast of coloration. In addition to the Lincolnshire locality noted by Mr. Tutt, the late Frederick Bond informed me that the var. *argentea* is commonly taken in the South of England; and also that Mr. Tutt's var. *obscura* is not confined to Scotland, but was bred by Mr. Bond from Tilgate larvæ near Brighton. Dr. Buchanan White also writes that none of his Scottish *C. duplaris* can be called pale, though variable in tone of ground colour, but that his English specimens have more of a brownish tinge, and are smaller. Apparently the Irish forms of both species differ in a parallel direction from those of Scotland and parts of England.

Localities: Ballycastle, one (*Curz*), Co. Derry; Ardara, one (*J.*), Co. Donegal; Knocknarea, rare (*R.*), Rockwood, Hazlewood, and Markree Castle, occasional, Co. Sligo; Drumreaske, Co. Monaghan; Favour Royal, not very rare; Altadiawan, numerous, Tyrone; Farnham, Co. Cavan, a few; Cookesborough and Killynon, Westmeath, not very rare (*Miss R.* and *K.*); Belleisle, Fermanagh; Glendalough and Moycullen, Connemara, and Merlin Park, Co. Galway; Crossmalina, Co. Mayo, not rare; Tinahely (*Bw.*), Co. Wicklow; Cappagh, Co. Waterford; Killarney (*B.* and *K.*), near Kenmare, scarce, and Glengarriff, not scarce, Co. Kerry; Crookhaven, one, Co. Cork.

[Note.—I omitted, when recording the larvæ of *Bombyx quercus*, taken at Killarney by Mr. Watts, to say that the resulting imago was var. *callunæ.*]

(To be continued.)

NOTES ON *BALTIA*, Moore, AND *MESAPIA*, Kirby.

By James Edwards, F.E.S.

In his original description of *Mesapia shawii*, Bates says (Henderson and Hume, Lahore to Yarkand, p. 305) that the neuration is the same as that of *peloria*, Hew., except that the second branch of the subcostal is emitted long after the end of the cell. Moore, in founding the genus *Baltia* on the same insect (Ann. & Mag. Nat. Hist. 1878, p. 228), disposes of this fiction, and describes the venation accurately enough, but in language which might not seem quite clear to students accustomed to deal with the veins on the numerical system. As a matter of fact, veins 5, 6, 7 and 8 are stalked from the upper angle of the cell in the male, and in the female vein 5 arises at or just beyond the upper angle of the cell; the five subcostal branches of which Moore speaks are present in all the specimens which I have examined,—that is to say, vein 8 is present but extremely short, as in typical *Pieris;* indeed, the position of vein 5 in the fore wing (which is the same as Moore's radial branch of the subcostal) is the main feature, in point of venation, which separates *Baltia* from *Pieris*. A few other Pierid genera have nearly or quite the same position of vein 5 in the fore wing, but they are otherwise widely separated from *Baltia*. These are—*Pseudopontia*, Plotz, a curious African genus, with the cell not more than one-third as long as the fore wing, and veins 5, 6 and 7 stalked; *Elodina*, Feld., a genus found principally in the Australian region, in which vein 5 springs from the upper angle of the cell, and 6, 7 and 8 are stalked, but vein 8 is given off about midway between the upper angle of the cell and the base of vein 7; *Phyllocharis*, Schatz, in which vein 5, the stalk which bears veins 6, 7, 8 and 9, and vein 10, all spring from the upper angle of the cell; and *Phulia*, H.-S., in which vein 5 and the long stalk which bears veins 6 and 7 spring from the upper angle of the cell. Moore's expression, "allied to *Mesapia*," is misleading with regard to the genus *Baltia:* allied to *Mesapia* it undoubtedly is, in that both *peloria*, Hew., and *shawii*, Bates, are Pierids; but there the alliance ends, as the two insects are very distinct both in facies and venation.

Dr. Dixey (*in litt.*) does not share Mr. Kirby's opinion (*ante*, p. 100), that the specimens in the Hope collection at Oxford are so different from Groum-Grshimailo's figures of *Pieris shawii* (Rom. Mem. sur. Lep. p. 222, t. 10, fig. 2, *a*, *b*) that they probably represent a distinct but allied species.

Synchloë butleri, Moore, agrees with *shawii* in point of venation, save that the disco-cellulars of the hind wing are much more oblique, and the cell, consequently, more pointed.

Pieris peloria, Hew., is, for all practical purposes, an *Aporia;* that is, if *hippia*, Brem., is to be regarded as an *Aporia;* but if the latter name be restricted to *cratægi*, L., then the name *Mesapia* might be applied to those Aporias in which the hind wing below is yellow or yellowish, with the veins more or less broadly margined with black. It would then include *hippia*, Brem., *martineti*, Ob., *goutelli*, Ob., *bieti*, Ob., &c.

Mr. Kirby's description of the venation of the fore wing in *peloria*, Hew. (*ante*, p. 101), seems somewhat at variance with the fact, particularly as he says "the third (subcostal) emitted a little beyond the cell and running to the costa just before the apex, the fourth emitted about half-way between the end of the cell and the apex." It is not easy to see how this description applies to the insect under consideration at all, because vein 7 (which, I presume, is the same as Mr. Kirby's fourth subcostal, as it certainly is the fourth subcostal of Schatz) arises at a point at least twice as far from the end of the cell as from the apex of the wing. Mr. Kirby's third subcostal I cannot identify with certainty; but it is clear that in *peloria*, Hew., there is normally no vein in the fore wing emitted beyond the cell, except at a distance from the cell two-thirds as great as the width of the cell, and the phrase "a little beyond the cell" hardly expresses this. In the fore wing of *peloria*, Hew., veins 6, 7 and 8 are stalked from the upper angle of the cell, the distance between the origin of veins 6 and 7 being about equal to the distance between the upper angle of the cell and the base of vein 6, and vein 8 is about two-thirds as long as 7; in short, the venation is practically that of typical *Aporia*. The long hairs at the base of the wings in *peloria*, Hew., although they are wanting in typical *Aporia*, afford no distinction from *Metaporia* as exemplified by *nabellica*, Bdv. *Pieris davidis*, Ob., with the hind wing below like *Mesapia*, has the Pieris antennal club and heavy wing-fringes, and the fork formed by veins 7 and 8 is small, as small as in typical *Pieris*; this species is, however, rather a *Metaporia*, for it exhibits, in the suffused blackish post-median band which reaches from the costa to vein 2 on the fore wing above, the commencement of the post-median dark band proper to *Metaporia*. The Metaporia-pattern is indicated in *soracta*, Moore, further developed in *belucha*, Marsh, and *leucodice*, Ev., and reaches its greatest development in *nabellica*, Bdv.

P. dubernardi, Ob., is a true *Pieris* in antennal club, wing-fringes, in the minute fork formed by veins 7 and 8 of fore wing, and more particularly in the suffused blackish spot in cell 3 of the fore wing and the black border round the tip of the latter from veins 3 to 9, although the hind wing below is yellow, with the veins broadly, and a suffused post-median band, blackish. The yellow under-surface of the hind wing, with broadly dark veins, appears to originate in *P. napi*, L.

P. mesentina, Cr., has veins 6, 7 and 8 of the fore wing as in *Aporia*; but the antennal club, though not narrow enough for typical *Aporia*, is too narrow for *Metaporia*, and the essential wing-pattern differs from that of either.

The foregoing notes are the result of my review of certain Pierids in Mr. Elwes' collection, in the light of Mr. Kirby's article (*ante*, p. 99).

Colesborne, Cheltenham, March 12th, 1894.

FURTHER NOTES ON CERTAIN VARIETIES OF *SPILOSOMA LUBRICIPEDA.*

By W. H. Tugwell.

It appears that the first to give the name *radiata* to the var. of *S. lubricipeda*, now referred to *zatima* of Cramer, was Haworth; but, so far as I can discover, he only described it, no figure being given, and certainly that description (as given in the old Trans. Ent. Soc. i. 366, 1809–1812) is extremely vague. He describes it thus: *Spilosoma radiata*, Sp. 5, *radiata*, "Alis anticis nigris, maculâ magnâ lobatâ variiesque flavicantibus, Haw." No mention is made of that important and most striking feature of the insect, *viz.*, the black hind wings, with their finely pencilled ochreous-yellow nervures or veins, and yellow fringes. In fact, Haworth's description rather applies to the var. of *S. menthastri*, as figured by Curtis in 'British Entomology,' plate 92, var. *walkeri*. If Haworth was describing his insect from the *zatima* type, he could not have failed to note so striking a feature as the hind wings of *zatima* always are. The hind wings vary to some extent, but out of some four hundred specimens that I have bred not a single one fails to show these black hind wings with finely pencilled lines. The earliest English figure I can find of *radiata* is in Wood's 'Index Entomologicus' additions, plate 52, fig. 1657, published in 1839. This clearly gives a male exactly of the type I have bred so many of, and is drawn from a specimen, taken in Yorkshire, which was in Mr. Bentley's cabinet; but the date of capture is not given. In the 'Entomologist' (vol. vii. 169, 1874) the late Mr. Edward Newman gave an excellent woodcut of a female, under the name of *Arctia radiata*, and makes the following remark: "Mr. Dawson (of Driffield, Yorkshire) has most obligingly lent the specimen for figuring in the 'Entomologist.' The late Mr. John Curtis published a beautiful figure, of a very similar variety, under the name of *Arctia radiata*. A similar variety of *Arctia menthastri* occasionally, but very rarely occurs" (E. N.). Unfortunately Mr. Newman failed to state where this figure was given, and it has been thought by some that he had confused it with that of *menthastri* var. *walkeri!* but as he also mentioned the var. *walkeri* at the time, that certainly gives the idea that he had a knowledge of two separate figures, and, although I cannot discover such a plate, yet I have good reason to believe that Curtis did have *radiata*, sent to him from Lincolnshire, as the following extract from a letter to me, from Mr. W. H. B. Fletcher, clearly shows, and it is very probable that he would figure so beautiful a form. Mr. Fletcher writes: —

"The *radiata* form has been known to occur on the very extensive sand-hills of Lincolnshire, lying on the coast between Boston and

Cleathorpes, for years past. Why Yorkshire has claimed a monopoly of it I do not know. An old uncle of mine, the Rev. J. Mossop, of Covenham Rectory, Louth, used to breed it from the Theddlethorpe and Mablethorpe part of the coast. He had considerable correspondence with Curtis, through the older Dale, about the form, and I think insects passed as well as letters. Mr. Mossop died about 1870, and his widow gave me some of the letters, but I cannot find them now. In any case I have some of the moths. One of them, a female, is as nearly as possible like that figured in the Entom. (vii. 169, 1874); another, a male, resembles the figure in Humphrey and Westwood (plate 18) after allowing for bad drawing; a third is about equal to the figure in the Entom. (xxvi. 257), var. *deschangei*. Curtis's figure I have not seen, but it would not surprise me if it were drawn from one of my old uncle's specimens."

Mr. C. W. Dale, too, gives me some additional information on these captures of the Rev. Mr. J. Mossop, and, writing me on March 3rd, he says, "My father, the late James Charles Dale, had *three* specimens of Mr. Mossop's *radiata* (instead of one that I mentioned, *ante*, p. 97)," and also states "that the Rev. J. Mossop's insects were bred from larvæ that he found at Saltfleet, feeding on elder, in August, 1836, and bred in June, 1837."

This evidence most conclusively substantiates the fact of Lincolnshire producing the form *radiata*. The following extract from a letter from Mr. W. Hewett, of York, on the Driffield specimens, is important. I had written him to ask if the Driffield specimens he had seen were the same as the one figured from Mr. Dawson in the 'Entomologist' (vii. 169, 1874), and if caught or bred? He replies as follows:—

"The three Driffield specimens I referred to in my letter to Mr. Porritt are identical in form with the one figured in the 1874 Entom., but that figure was not drawn from either of those examples. I have not the slightest hesitation in saying *they are genuine*, as I know the party well. They are captured specimens, *not bred*. I do not think the owner ever made an exchange in his life. The specimens are set on common household pins" (W. H.).

Thus all the English specimens of *radiata* are, so far as I can find, reported either from Yorkshire or Lincolnshire, whilst most of the notices of var. *walkeri*, Curt., are from Scotland.

Heligoland is generally spoken of as the home of *zatima*; but at any rate it is clearly proved that, for the past fifty years, this grand form, too, has occurred in both Yorkshire and Lincolnshire.

Greenwich.

VARIATION OF LEPIDOPTERA AT RINGWOOD.

By J. H. Fowler.

Considering the extraordinary season of last year, it seems surprising that the Diurni did not show any marked increase in variation; the great drought, one would have thought, would at least have caused a good many dwarfs, but in my collecting I saw but few. *Epinephele ianira* and *E. hyperanthes*, also *Argynnis paphia*, occasionally produced such, but the Vanessidæ and Argynnidæ were unusually fine and well marked. Var. *valesina* outnumbered the female type of *A. paphia*, and was frequently very pale, almost blue all over; the dark form, in fair numbers, occurred also.

A few species have shown a tendency to albinism or bleaching: thus, a specimen of *Argynnis euphrosyne* with left primary white, the dark markings almost obsolete; *A. aglaia* with the primaries centred with large pure white spaces filling up several of the cells, the secondaries with the first four cells each pure white also; in opposition to this, a female specimen, which I took upon the same day, has the primaries almost black; *A. adippe*, secondaries (above) transversely streaked with silver bars, four upon the left and two upon the right wings, the superiors are curiously blotched with silvery white. The yellow-spotted form of *A. paphia* was not more numerous than usual. I took a specimen of *A. euphrosyne* irregularly marked with yellow, but distinct from the *paphia* form; another has the spots of the right primary broken up and displaced.

A female *E. ianira* has the fulvous spaces evenly divided into small spots, and a male is not much larger than a specimen of *Cœnonympha pamphilus*.

The best variety amongst the Rhopalocera is undoubtedly a splendid example of *Argynnis aglaia* (*charlotta**); primaries with the third discoidal spot absent, fourth enlarged; submarginal area with the usual spots, the three first and anal ones confluent to marginal lunules; marginal line black, finely centred with fulvous, inside; the row of pale spots are much enlarged, central line fine. Secondaries, a round black spot near the base, near from which a long well-defined hammer-headed bar proceeds; marginal line and pale spots same as upon the primaries, but inside the marginal line there are seven broad black bars nearly reaching to the central line; on the under surface the secondaries have four very large silver bars arched from the base, a row of central spots, the first yellow, the other six normal; those upon the margins, seven in all, are enlarged, the first two slightly elongated; the primaries, from the anal angle upwards, nearly represent the upper surface, some spots being confluent; the tips have each four large and one small silver spots. This specimen is a male, very richly coloured upon all the wings.

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* A figure of this interesting variety will be given in the May number of this Journal.—Ed.

Amongst the Heterocera I took a specimen of *Callimorpha dominula* with the secondaries suffused all over with black; a female *Euchelia jacobææ* with the carmine band extending from the base, along the costal area, and down the outer margin almost to the inner margin of superiors, otherwise typical. I have now several pupæ resulting from ova deposited by this insect.

I have often noted that the so-called bleaching occurs frequently, but in irregular form, in many species, and under the following conditions: firstly, quite white; secondly, with a suffusion of dark bluish, shaded *with grey;* thirdly, with spots or spaces paler than that of the ground colour. Of the first form a few examples will suffice: *Epinephele ianira*, *E. hyperanthes*, *Argynnis euphrosyne*, *A. aglaia*, *Polyommatus phlœas*, and one *Colias edusa* (a few *Lycæna corydon* from Dorset). Of the second form, *Vanessa io*, *V. atalanta*, *V. urticæ*, *Satyrus semele*, &c.; and of the third, *Hesperia linea*, *Cœnonympha pamphilus*, *Argynnis euphrosyne*, &c. *Satyrus egeria* is often greasy and very pale. A specimen of *Euchloë cardamines*, with several almost transparent spots; I think the aberration of the two last-mentioned species is due to lack of scaling or pigment.

If *Vanessa atalanta*, *V. io*, or *V. urticæ* are bred in numbers and crowded, the second form referred to can often be produced. I have always considered this kind of aberration due to overcrowding; the larvæ changing or about to change to pupæ are subjected to almost constant motion and activity, as they crawl over each other, and disturb those which have only just pupated, —a critical time, when the least pressure would be likely to injure them in some way.

It seems very probable, as Dr. Chapman suggests in the 'Entomologist' of January last, that these spotted aberrations are caused by pressure, there being only one thing against this theory in general, and that is that many specimens are bleached or spotted upon the inferiors only which are protected in the pupal stage; in such cases would not both wings show signs of injury?

The only moth I possess of the bleached form is a specimen of *Emydia cribrum*, in which the right superior is almost white, the other wings being normal.

It will be noted that all the above species are ground-feeders, and this doubtless has something to do with it; very few of them ever pupate more than a few inches from the ground. I have found pupæ of *Argynnis paphia* four and five feet from the ground; but in pale spotted varieties of this species the aberrant characters are of a more regular and definite form.

I remember, about seven or eight years ago, assisting a well-known farmer in Dorset to carry his hay. I was appointed to work upon the rick, and, whilst so doing, I found a great number of *Epinephele ianira* pupæ, but they nearly all died, and the few which emerged did not exhibit any aberration; pressure in this case undoubtedly caused such a mortality; the grass upon being cut must have overlaid most of them. I also took pupæ of other species, but forget whether I bred any imagines from them.

Ringwood, January, 1894.

NOTES AND OBSERVATIONS.

Migration of Lepidoptera.—Notwithstanding the tropical heat of Brazil there is a large rainfall, and what is an important factor in the case, the rain falls at frequent intervals during the summer, thus inducing a rapid and luxuriant vegetable growth, resulting in immense forests and thickly wooded hills, with creepers and twiners matting the forest trees together. The rocks disintegrate rapidly in Brazil, forming a rich soil, so that even the tops of the mountains are covered with a luxuriant growth of trees and underwood. No wonder therefore that there is so great a profusion of insect life where the conditions for their nutrition are so very favourable, While staying at Santos, the local newspapers reported that an immense swarm of "borboletas" (butterflies or moths) had invaded S. Vicente, a seaside village near Santos. The insects had arrived in such immense numbers that they formed a cloud which, they reported, even obscured the sun! They invaded the village, swarming into the houses and flying against everything. The greater portion of the swarm was said to have passed over the village with a strong wind which was blowing at the time off the land and in the direction of the sea. Large numbers were reported to have fallen into the sea, and to have been subsequently cast up on shore in such large quantities that the shore was said to be strewed for some distance with the bodies. Wishing to see what I could of so extraordinary an occurrence, I took the steam-tram down to S. Vicente about three days afterwards. No traces of the passage were to be seen in the village: so my friend and I went to the sea-shore, and there at high-water mark we found abundant proofs as to what the swarms consisted of. We found large numbers of the bodies of a moth about an inch and a-half long, and, so far as we could judge, of a creamy grey colour, resembling that of the English puss-moth (*Dicranura vinula*). The bodies had, however, been so much knocked about on the sand that they were very imperfect, and not in a state for classification. For some considerable time previous to the appearance of the swarm the weather had been very rainy, and, so far as I could learn, unusually so for the time of the year. The temperature had therefore been rather lower than usual. When, however, the weather cleared up, there was a considerable and sudden rise of temperature for several days, and to this I think must be attributed the sudden appearance of an immense number of these moths simultaneously; their gradual issue had probably been delayed by the colder rainy weather. It would seem that the direction of the wind influences to a certain extent the direction of flight of butterflies. When crossing from Rio Janeiro by steamer to the island of Paqueta, in the bay of Rio, I saw butterflies pass frequently across the bay with the wind, but I saw none pass against the wind. They were going from the direction of Nitheroy towards Maua, on the other side of the bay. When I returned, about a week afterwards, from Paqueta to Rio, I observed the same flight across the bay, and from more or less the same direction. They did not go past in a swarm, but singly or two or three together, and at sufficiently frequent intervals as to attract attention.—Wm. C. Tait; Oporto, January, 1894.

Macroglossa stellatarum and Colour.—Referring to Mr. Shaw's article (*ante*, p. 20), and Mr. Bedford's and Mr. Johnson's observations thereon (*ante*, p. 62), in the translation of Professor Hermann Müller's work, 'The Fertilization of Flowers' (Macmillan & Co., 1883), p. 119, it is stated that "*Viola calcarata*, L., greatly surpasses *Viola tricolor* in the size of its flower and the length of its spur (13 to 25 mm.). It is fertilised only by Lepidoptera, chiefly by *Macroglossa stellatarum* (25 to 28 mm.), our quickest worker. I have seen this insect visit 194 flowers on different plants in 6¾ minutes, and I could see it cross-fertilise them by means of its proboscis, dusted with white pollen." The different species of *Viola* are discussed with reference to the insects fertilising them, including nocturnal and other Lepidoptera, amongst the species mentioned as visitors being *Vanessa urticæ*, *Rhodocera rhamni* (*Viola odorata*), *Pieris rapæ* and *P. napi*, and *Rhodocera rhamni* (*Viola sylvatica*, Fries), and *Pieris rapæ* and *P. napi* (*Viola canina*). The evolution of colour in violets, from an original yellow, is also alluded to, and the colours of flowers with reference to their fertilisation by diurnal or nocturnal species touched upon; and in this connection may it not be that the cause of the purple, lilac, and black shades of *Viola* being neglected by *Macroglossa stellatarum* (as mentioned by Mr. Shaw) is that they are the more advanced forms? With reference to *Caltha segetum* mentioned by Mr. Shaw (*ante*, p. 21), although this plant does not appear to be referred to in the above work, a list of insects visiting *Caltha palustris* (including Diptera, Coleoptera and Hymenoptera) is given, pp. 79 and 80, but no Lepidoptera are included in the list; is it not, therefore, probable that neither species of *Caltha* is suitable for fertilisation by Lepidoptera? and is not the true reason why any particular flower is shunned by certain insects and visited systematically by others, that the visiting insects alone are able, having regard to the mutual formation of flower and visitor, to fertilise the particular species of flower, rather than that the insect has acquired a taste for the particular nectar yielded, as suggested by Mr. Bedford? The whole basis of the above work appears to proceed on the first view. With regard to species of *Geranium*, on p. 157 it is stated that *Pieris napi* visits *Geranium robertianum*, and that twenty-one species of Lepidoptera have been found upon the flowers of *G. sylvaticum*, which is visited by seventy-four species of various orders. The flowers visited by *Macroglossa stellatarum* are stated to be (as observed), *Dianthus carthusianorum*, L., *Æno-*

thera biennis, L., *Echium vulgare*, L., *Ballota nigra*, L., *Nepeta glechoma*, Benth., *Erythræa centaureum*, L., *Syringa vulgaris*, L., and *Onopordum acanthium*, L. Reference is made to the rapidity with which the Sphingidæ perform their work as fertilisers, and it is stated that most nocturnal flowers have adapted themselves specially to those Lepidoptera. The first place, as fertilisers generally, is given to bees, the Lepidoptera taking only the second or third place, before or after. It is, perhaps, needless to refer to the many other interesting facts and conclusions given in the above work.—GEORGE W. OLDFIELD; 2, Longridge Road, Earl's Court, S.W., February 12th, 1894.

EARLY MORNING APPEARANCE OF BUTTERFLIES.—I think it would be interesting if someone would undertake the compilation of a list of British Rhopalocera, showing the earliest, latest, and average hours during the day when the species are on the wing. On Aug. 18th, 1893, at 6.15 a.m., I observed quite a number of *Polyommatus phlæas* flying about, there being fully two dozen of this species on one flower-bed. The weather at the time was intensely hot and dry, the mean temperature being then 72°, and an exceptionally low humidity prevailed. Perhaps others can show an earlier time of flight.—F. W. FREIR; Elm House, Walthamstow, Jan. 22nd, 1894.

APLASTA ONONARIA IN THE BURNEY COLLECTION.—From your notice it appears that four specimens of the above were ticketed as having been take by my friend Bernard Piffard. Allow me to say that that gentleman never captured but *one*, which was duly recorded in the E. M. M., vol. iii., p. 110, and which he generously gave to his great friend the late Henry Doubleday, in whose cabinet it, no doubt, still remains, unless that fine collection has become scattered.—H. G. KNAGGS; Camden Road, London, N.W., March 5th, 1894.

LYCÆNA ARGIOLUS.—During last season the great abundance of *L. argiolus* in East Devon, especially in districts near the sea-border, is quite worthy of record. It would be interesting to hear whether this species was as common elsewhere in the south, or did it, like *Colias edusa*, only abound in this locality last year? I have repeatedly noticed that *L. argiolus* is usually plentiful after the *Ilex aquifolium* has been profuse in its berries the winter preceding. Can any reason be suggested for this coincidence?—B. STAFFORD CHOPE.

COLIAS EDUSA VAR. HELICE, AND C. HYALE.—I think it may be of interest to record the exceptional abundance of this species in East Devon, from the end of July to the middle of Sept., 1893. In one field of *Trifolium repens*, during the latter part of August, I captured as many as I cared to take away (amongst them some fine females), and could have taken scores more in the same field when the crop was being cut a week later. The var. *helice* was captured in a rough field at the end of May in the same locality, though only three specimens of *C. hyale* were seen during the season. With reference to Mr. Clarke's remarks, bearing out Mr. Bankes' statement that *C. hyale* seldom ranges so far west as Dorchester and Weymouth, I am unable to confirm the experience, for during the last ten years or more I have repeatedly captured it at intervals all along the S. Devon coast, and at

Marazion on the Cornish coast; even, indeed, as far west as the cliffs between Penzance and the Land's End, where in 1881 it was plentiful; but the var. *helice* I have never heard of being taken further west than Sidmouth.—B. Stafford Chope.

Biston hirtaria and Cleora viduaria in Scotland.—In reference to Mr. Hodgkinson's note (*ante*, p. 65), I should like to remark that this is the first time I ever heard of *C. viduaria* being found in Scotland. *Biston hirtaria* is widely distributed in the Rannoch district, but appears to be scarce. I have seen it on the birch-trees near Annet, Carrie, and Carnghouran, It does not appear to differ much from the London form.—Wm. Reid; Pitcaple, N.B.

Reissue of Hübner's Exotic Lepidoptera.—Hübner's works on Lepidoptera have long been very scarce and costly, and we are pleased to learn that an enterprising Belgian, M. P. Wytsman, is bringing out a new edition of the 'Sammlung Exotischer Schmetterlinge,' and likewise of the 'Zutrage.' We have long been surprised that so little has been done in bringing out new editions of some of the rarer illustrated entomological books; for some of great value are practically unobtainable, and would, we believe, easily find a sale sufficient at least to repay the cost of production.

Note on Spilosoma radiata, Haw.—This grand variety was described by Haworth in the 'Transactions' of the Entomological Society of London, published in 1812, p. 366. It appears to have been confounded by Newman (Entom. vii. 169) with an insect which Curtis figured and described under the name of *walkeri*. They are both figured in Humphrey and Westwood's work. I have three specimens of *radiata*, given to my father by the Rev. J. Mossop, who had them in June, 1837, from larvæ he found feeding on elder, at Saltfleet, in August, 1836. I have also specimens of the York form, which is somewhat intermediate between *radiata* and the type. The specimens of *zatima* in Mr. Richardson's cabinet do not appear exactly to accord with my old specimens of *radiata*.—C. W. Dale; March 1st, 1894.

Rare British Diptera in 1893.—Amongst some duplicates given to me by my friend Mr. Beaumont, and which were taken by himself in Ireland in August last year, was a solitary male specimen of *Sciomyza rufiventris*, Mg. This, Dr. Meade informs me, is new to Britain; but on referring to Mr. Verrall's list, under the family Helomyzidæ, I find a single genus and species, i. e., *Tephrochlamys rufiventris*, Mg. I think this may perhaps refer to the same dipteron, but have not had an opportunity of submitting the fly to Mr. Verrall; possibly Dr. Meade had overlooked this genus when determining my specimen. *Meigenia majuscula*, Rond., is also new to Britain; a single specimen of this handsome Tachinid was taken by my daughter, in my garden at Dulwich, in June last. This species will be described by Dr. Meade in his forthcoming Supplement to the Tachinidæ. *Degeeria pulchella*, Mgn.: this species is also very rare, having only been described by Dr. Meade from a specimen or two in Mr. Dale's collection, which were captured at Glanvilles Wootton. I am indebted for two [illegible] specimens to my friend Mr. Adkin, who bred them from larvæ of *Peronea maccana*. *Urellia eluta*, Mg.: a solitary male of this rare species of Trypetidæ was taken by myself while sweeping herbage at Lewisham, in September last.—T. R. Billups; 20, Swiss Villas, Peckham, S.E., March, 1894.

Notes on Wasps during 1893.—As in other parts of England, wasps were very abundant in this district of East Anglia during the spring and summer of last year, but I do not think that they were more numerous than in 1887, which summer was also remarkable for its heat and drought. They made their appearance much earlier in 1893 than is generally the case, and many nests were found in full activity by the latter part of May. On June 7th I removed, for so early in the season, a very large nest, which was being built in a disused pigeon-house. I suspended it from the rafters of an outhouse, in order to watch them in their building operations. They worked rapidly at it for a time and the wasps were very numerous. I examined the nest almost daily until July 10th, when I left home for a few days. On my return on July 19th I found to my astonishment that the wasps had entirely disappeared, the nest being in perfect condition and fully protected from the weather, and it had been quite undisturbed after its removal. As far as I could see there was nothing to account for their extraordinary disappearance. I believe that they were one of the tree wasps, but the nest was so unexpectedly abandoned that I was unable to ascertain the species. On Aug. 4th I was shown a hole in a bank in which I was told was a very strong nest, but as I could not see any of the insects about I dug it out of the ground and found that it was deserted. I was assured that no attempt had been made to destroy it, and the nest seemed quite perfect; and there were no dead insects to be seen, which I should have expected to find if they had been destroyed. Although I handled the nest and carefully examined it, not a single wasp made its appearance. From what I was told, it could not have been deserted for many days. On Aug. 8th I took from the branch of a pear-tree a nest of one of the tree-wasps. That, too, was quite deserted, but I was informed that a short time previously the wasps simply swarmed about the nest, so much so that the part of the garden in which it was situated was carefully avoided. I observed that some of the cells in this nest were sealed up, but as no wasps made their appearance they apparently died while in the pupal state. The greater number of the cells were entirely empty. What the cause was which made the wasps forsake their nests so early in the season I cannot tell. I carefully examined them, but I could ascertain nothing to account for it. I have never before known such cases as these, as in all the nests which I have previously observed the wasps have been quite active until the autumn nights have become cold. I should like to know if a like occurrence has been observed elsewhere, and if the desertion of the nest by the wasps is in any way to be accounted for; I should be glad to learn the reason. — Edward Ransom; Sudbury, Suffolk, Jan. 29th, 1894.

Melanic form of Phigalia pedaria (= pilosaria).—Mr. George Rose, of Barnsley, has very kindly sent me a fine series of *P. pedaria*, which he bred in February last from ova deposited by a black female in the spring of 1893. The series comprises sixteen males and fiv females; all of the latter and six of the males are black; three of th other males are similar in colour to the southern form, but th majority of the remainder appear to me to be more strongly marke than is usual, even in northern specimens. Mr. Rose informs me tha the first black example of this species he ever saw was taken about te years ago, by Mr. Henry Willetts, at Wharncliffe. Ova from blac females, paired with black males, have been obtained by Mr. Rose thi year, and it will be very interesting to hear of the result obtaine next spring.—RICHARD SOUTH; 12, Abbey Gardens, St. John's Wood N.W.

IMPORTED LARVÆ.—A larva of *Pyrrharctia isabella* was found in box of Canadian apples on Dec. 15th, 1892, in a Chester provision shop. It resembled *Arctia caia*; 1½ in. long; thickly clothed with uniformly short bristly hairs (as if they had been cut with scissors); head small and shiny black; legs and claspers black. The short, bristly clothing coloured in three unequal divisions—black, three segments; russet-red, like *A. caia*, six segments; and, lastly, the two anal segments black. There is a slight collar of russet-red bristles behind the head, and a few black bristles (dorsally) on the segment preceding the last two. At the time tassel-fringes were worn on ladies' mantles, &c., and the caterpillar was picked up as a fallen tassel. I kept it till the end of February, 1893, when it died. I am indebted to Mr. J. Fletcher, Ottawa, Entomologist to the Canadian Government, for its identity. He tells me it is one of the commonest Canadian insects, and non-injurious, as it feeds on low weeds, such as dandelion, plantain, grass, &c. Two larvæ only of *Heliothis armigera* were obtained, from Valencia tomatoes in June. They were nearly full-grown and pupated in due course; imagines emerged July 9th and and 19th. These caterpillars have been scarce, home-grown and Jersey tomatoes commanding the markets. I get them only from the Valencia boxes.—J. ARKLE; Chester, Jan., 1894.

SECOND BROODS IN 1893.—*Agrotis segetum* (Sept. 12th to Oct. 10th), both sexes very variable. *A. exclamationis* (Sept. 26th), one specimen; a fine form with the dark orbicular and reniform spots absent; the lower wings are smoke-coloured with white fringes. *Leucania impura* (Sept.), paler than the June and July brood. *L. pallens* (Sept. 9th), colours warmer than in the summer brood. *Triphæna orbona* (Aug. 13th to Sept. 13th), much paler. *Caradrina cubicularis* (Aug. 13th to Sept. 13th), many of the specimens had their wings infested by a scarlet mite. At the particular spot where I sugared, some species appeared in unusual numbers, as *Noctua plecta*, *N. xanthographa*, *A. segetum*, and *Phlogophora meticulasa*. Others, as *Miana strigilis* var. *æthiops* (swarming last year) and *Xylophasia polyodon*, were, in comparison with former seasons, poorly represented. A fine *Gonoptera libatrix* fell a victim to the sweets on July 25th.—J. ARKLE; Chester.

CAPTURES AND FIELD REPORTS.

Collecting in the Norfolk Broads in 1893.—I spent nine days (July 26th to Aug. 3rd) of last season collecting in the Broads, the chief object of my visit being to complete a series of *Leucania brevilinea* (a few specimens of which I had taken on a previous visit to the same locality in August, 1889); in this I was very successful, the nights of July 25th, 26th and 27th producing some twenty specimens in almost perfect condition, besides a number of worn examples netted and released after due inspection. The field of operations consisted of large reed-beds stretching alongside the River Bure; part of these beds had been recently cut, and on this cut portion one could walk without injuring or trampling down the growing reeds. *L. brevilinea* was accompanied by *Tapinostola fulva* in varying shades of colour from pale grey to brick-red, occasional *Noctua rubi*, with *Apamea leucostigma* (*fibrosa*), and *Cænobia rufa* (*despecta*) also put in an appearance. *Lithosia griseola* and var. *stramineola* were also present, with *Epione apiciaria* and *Cidaria testata* flitting round the alder bushes; several *Phibalapteryx vittata* (*signata*) and *Acidalia immutata* were also netted. On July 28th I rowed to Barton Broad (some twelve miles by water), taking the requisite entomological *impedimenta* in the boat with me, for a stay of two or three days; the weather was perfect, and the row a most enjoyable one, the enjoyment being considerably enhanced by the sight of occasional specimens of *Papilio machaon* flying in the sunshine, and sometimes lazily flapping across the river. The fens at Barton produced at night *Celæna haworthii*, *A. leucostigma*, *Calamia phragmitidis*, *Noctua rubi*, *Caradrina quadripunctata* (*cubicularis*), and *T. fulva*, in more or less abundance, but *L. brevilinea* was here apparently scarce, one only being observed. *C. haworthii* and *A. leucostigma* were very partial to the flowers of various grasses, also to the honeydew on the leaves of the sallow bushes. *Leucania impura* also swarmed in the latter situation. *Chilo phragmitellus* was plentiful, flying to the lamp with which I searched the bushes. A long day's work amongst the "gladdous" *Typha latifolia* and *T. angustifolia* brought many larvæ and pupæ of *Nonagria arundinis* (*typhæ*) to light, but only three pupæ of *N. cannæ*. An evening spent amongst the reed-beds on Barton Broad found *Paraponyx stratiotata* in abundance, also *Hydrocampa nymphæata*; but one specimen only of *Nonagria neurica* was taken, at rest on a reed-stem: this species was a great disappointment; I worked hard, but could not find its head-quarters. In the daytime *Crambus selasellus* was occasionally disturbed amongst the grass alongside the numerous dykes and ditches so characteristic of all fen lands. Amongst the Tortrices I obtained, one afternoon, a beautiful series of *Terias caudana*, by beating round an alder carr; accompanying these were occasional specimens of *Grapholitha penkleriana*, *Phoxopteryx siculana*, and *Phlæodes immundana*. Entomologists accustomed to fen collecting know the extraordinary effect a slight chill in the atmosphere has upon fen Lepidoptera; if there is even a slight mist rising over the level fen, you may as well stop at home. One night I had a curious exemplification of this fact: rowing down the river I observed the fatal mist creeping over the fen, but, having started, I did not care to return at once, so landed and lit the lantern as usual. Up to 10 o'clock the bag was two *T. fulva* only, and these were taken at rest on the reed-stems; not an insect moved where the previous evening they had been flying in abundance. I was about returning to the boat, when I noticed a bank of clouds coming up in the distance; thinking they would probably cause a slight breeze to spring up when they got nearer, I lit a pipe and waited; the clouds came over, and the light wind which came with them dispersed the mist, causing a warmer feeling in the atmosphere. In a few minutes insects were on the wing, and I returned home with full boxes in lieu of empty ones, patience (with a little knowledge added) meeting, in this instance, with its due reward.—G. H. Conquest; 6, Greenleaf Road, Hoe St., Walthamstow, Feb., 1894.

Collecting in the Neighbourhood of Worksop in 1893.—Now that the season of 1893 is over, and the new year has dawned upon us, I have gathered together the records of the past twelve months, in the hope that they may not be altogether uninteresting to the readers of the 'Entomologist'; for although this district cannot boast of a fauna such as attaches to the New Forest, or even other less-favoured localities, still it may possess some slight interest in being one but little known or worked by entomologists. And here I should like to mention that, although distant only eight miles from Sherwood Forest, except where specially mentioned, I have not included it in the radius of miles worked. I am in hope, too, that this paper may prove especially interesting to the increasing number of lady entomologists, as (with a few exceptions) the whole of the Lepidoptera named have been taken by my mother, my sister, and myself, during our country drives and rambles. For this reason it will be noticed that the Noctuæ are very poorly represented, owing to the little night-work that has been done. The season here, as elsewhere, was a particularly early one, our first captures occurring on Jan. 30th, on palings, when we took two *Hybernia leucophæaria* and three *Cheimatobia brumata*. These continued throughout February, and in March were joined by *H. progemmaria*, *Anisopteryx æscularia*, *Larentia multistrigata*, *Scotosia dubitata*, *Phigalia pilosaria*, *Scopelosoma satellitia*, *Tæniocampa gothica*, *T. cruda*, and *Cerastis vaccinii*. On March 21st the first *Brephos parthenias* was seen, and on the 23rd and 29th we sought it at its head-quarters in Sherwood Forest, only to find it as abundant as ever and in perfect condition. We took a beautiful series, the fore wings being greatly varied, and shading from light to dark through many gradations. As I have read of many failures to take *B. parthenias* this season, perhaps a few notes as to its habits, gathered from personal observation, may not be without interest. The place where we principally take this species is a long grass drive in Sherwood, and here anyone may be certain of getting a good bag. It is only necessary to go on a bright sunny morning in March, and look in the right place, which is not up amongst the birch trees, round which countless numbers can be seen flying, but down on the ground. *B. parthenias* loves the sunshine, and may be seen every few yards basking in it on the ground, forming a lovely picture as he sits with fully expanded wings on the bare sandy patches, or olive-green of the grass-grown drives, the orange of the hind wings contrasting brilliantly with the sober colouring of the surroundings In this way it can be easily taken; but if by any chance it should be missed, it is quite useless to give chase into the woods, as the colour of the under side blends so perfectly with the dead bracken that it is quite impossible to keep it in sight for more than a few yards. I have been told tha *B. notha* often frequents the same localities as *B. parthenias*, but I have never been fortunate enough to see one, although I have always been on the look-out for it. During the next few months our list of Geometers was greatly increased, and included the following:—*Uropteryx sambucata*, *Rumia cratægata*, *Metrocampa margaritata*, *Selenia lunaria*, *Odontopera bidentata*, *Crocallis elinguaria*, *Amphidasys betularia* (an intermediate variety between the ordinary form and var. *doubledayaria*), *Hemerophila abruptaria*, *Boarmia repandata*, *B. rhomboidaria*, *Tephrosia crepuscularia*, *T. punctulata*, *Geometra papilionaria*, *Ephyra punctaria*, *E. trilinearia*, *Asthena luteata*, *Acidalia remutata*, *A. incanaria*, *A. aversata*, *Cabera pusaria*, *C. exanthemaria*, *Corycia temerata*, *Macaria liturata*, *Halia vauaria*, *Panagra petraria*, *Fidonia atomaria*, *F. piniaria*, *Abraxas ulmata*, *Lomaspilis marginata*, *Larentia didymata*, *L. pectinitaria*, *Emmelesia decolorata*, *Eupithecia centaureata*, *E. abbreviata*, *E. coronata*, *E. exiguata*, *E. vulgata*, *E. indigata*, *E. assimilata*, *E. lariciata*, *E. castigata*, *E. rectangulata*, *Thera variata*, *Hypsipetes elutata*, *Melanthia ocellata*, *M. albicillata*, *Melanippe montanata*, *M. fluctuata*, *M. subtristata*, *Anticlea badiata*, *Coremia unidentata*, *C. ferrugata*, *Camptogramma bilineata*, *Scotosia dubitata*, *Cidaria corylata*, *C. fulvata*, *C. immanata*, *Iodis lactearia*, *Emmelesia albulata*, and *Cidaria suffumata*. In the Bombyces, Cuspidates, and Noctuæ we took *Hepialus hectus*, *H. velleda*, *Euchelia jacobææ*, *Chelonia caia*, *Arctia mendica*, *A. lubricipeda*, *Orgyia pudibunda*, *Bombyx quercus*, *Cilix spinula*, *Platypteryx falcula*, *Notodonta dromedarius*, *Thyatira derasa*, *Acronycta psi*, *Leucania conigera*, *Hydrœcia nictitans*, *Axylia putris*, *Xylophasia rurea*, *X. polyodon*, *Mamestra brassicæ*, *Apamea basilinea*, *A. oculea* (very varied), *Miana strigilis* var. *æthiops*, *Caradrina cubicularis*, *Agrotis nigricans*, *Triphæna ianthina*, *T. interjecta*, *T. pronuba*, *T. fimbria*, *T. comes*, *Noctua augur*, *N. c-nigrum*, *N. brunnea*, *Euperia fulvago*, *Cosmia trapezina*, *Epunda viminalis*, *Euplexia lucipara*, *Hadena adusta*, *H. oleracea*, *H. contigua*, *Plusia pulchrina*, *P. iota*, *P. gamma*, *Amphipyra pyramidea*, *Mania typica*, and *Euclidia mi*. On the evening of July 28th I went with my brother, the Rev. E. G. Alderson, to Sherwood Forest, in order to sugar for *Euperia flavago*. The night, which was favourable at starting, turned cold about 9 o'clock, so our bag was not so good as we had hoped for. However, we added to our captures *Noctua baja*, *N. triangulum*, *Ennomos angularia*, and *Xylophasia scolopacina*, the last new to us. Of *E. fulvago* we only took one battered specimen, which my brother caught on the wing about 8 p.m. We were evidently unfortunate enough to visit its favourite haunt at a time between the emergence of the two broods, as I read with pleasure that one of your correspondents, Mr. W. Ferris, had taken the species in plenty on Aug. 29th (Entom. xxvi. 327). During the greater part of August, and early in September, we were away from home, so my records are a blank for that time. On returning, however, we found that many of the autumn moths were stirring; I took, amongst others, *Xanthia ferruginea*, *Miselia oxyacanthæ*, *Anchocelis litura*, *Phlogophora meticulosa*, *Macroglossa stellatarum*, and *Himera pennaria*. In November and December we were still busy, with *Oporabia dilutata*, *Cheimatobia brumata*, *C. boreata*, *Hybernia aurantiaria*, and *H. defoliaria*. I have never seen the last-named species in such beautiful variety, and we were fortunate in getting a long series. Of Diurni this district is particularly barren, and it is quite an event to see a butterfly on the wing other than the cabbage white; 1893, however, proved rather an exception to the rule, if not in quantity at least in quality, as it produced one specimen of *Vanessa c-album* and two specimens of *Thecla w-album*, neither of which species had been heard of in Nottinghamshire for a number of years. I may also mention the great abundance of *Vanessa atalanta*, attracted by the half-decayed fallen fruit in our orchard. This closes my list for 1893, and we are hoping for a still better season in 1894. At present it certainly seems as if it would prove to be an even earlier one than its pedecessor, as we have begun collecting to day (Jan. 17th) with a long and variable series of *Hybernia leucophæaria*. This is certainly the earliest of our moths, and one which we always welcome, as its appearance is a sure sign that winter is drawing to a close, and that the delights of mothing, for another year, are again before us.—E. Maude Alderson; Worksop, Jan. 17th, 1894.

Notes from Ringwood, 1893.—A peculiar feature in the habits of most of the large forest butterflies during the drought through June to July 7th, 1893, was their partiality for frequenting the dense portions of the enclosures, and almost deserting the ridings; evidently the butterflies suffered severely from the want of moisture, such species as *Limenitis sibylla* and the large fritillaries being known to imbibe large quantities. Upon taking an excursion for a day's collecting in June to the Roe enclosures, I followed the bed of one of the streams in search of water to drink, and for the first time was disappointed in not finding sufficient to quench my thirst, not a pool being left, but I was well repaid by the sight I witnessed; the said bed of the stream for more than a mile was literally crowded with butterflies, the bulk being composed of *Argynnis adippe*, *A. paphia* var. *valesina*, and *Limenitis sibylla*, also *Argynnis aglaia*, *A. selene*, and *A. euphrosyne*, *Epinephele hyperanthes*, and others in lesser numbers; they were mostly busy probing the sand and gravel in search of water, some were quietly resting with folded wings, others seeking the shady nooks underneath the banks, but withal with a constant flutter of wings and restlessness, denoting how ill at ease they were. Although I netted several good varieties in other parts of the forest, I did not see anything but var. *valesina* worth taking upon this day, and of which I took twenty-six specimens. Altogether it was an entomological sight once seen never to be forgotten. *Gonopteryx rhamni* was unusually plentiful in the larval stage, *Limenitis sibylla* normal, imagines of *Vanessa cardui* almost nil, whilst *V. atalanta* was out from May to Nov. 11th; several late larvæ reared in-doors emerged up to the 26th, and a few of the last to turn into pupa died, becoming soft and watery, a fate which I believe all the late out-door specimens meet with. *Pararge egeria* was over before *P. megæra*, which had a late brood to Nov. 12th, in company with *Polyommatus phlæas*. I have added a fresh butterfly to my list from here, viz., *Thecla betulæ*, the larva of which I discovered in May, and quite by accident: I was beating *Prunus spinosa* in search of thorn larvæ, when to my surprise I got a number of *betulæ* larvæ, and have bred a nice series; it was not at all local, the area in which it occurred extending quite a mile around. I had no idea this species was found there, as I had never seen it upon the wing (until later). This may be a hint for others to obtain it elsewhere, by beating the thorns anywhere around trees. I went to the spot the first week in August, and saw several *T. betulæ* on the wing, also a few *Lycæna argiolus*; but owing to the rough nature of the ground both species were difficult to net. Nearly all the forest butterflies were over by the second week in July, at least a month sooner than usual. I certainly prefer a season when insects are longer upon the wing; the large fritillaries, for instance, did not last good for more than fifteen days or so, getting torn and rubbed. *Lycæna argiolus* was well out by April 17th, and very dark specimens were obtained. *Vanessa polychloros*, from March 14th to April 16th, was very abundant; and later the larvæ were in clusters upon almost every sallow in the forest. *Gonopteryx rhamni*, common in February; on the 17th I saw eight together, both sexes being represented. *Vanessa urticæ*, at the same time, but scarcer later on. *Colias edusa* was scarce during early September. *Argynnis euphrosyne* appeared on April 27th, and later was very abundant; whilst *A. selene* was scarce. *Syrichthus alveolus*, common. The spring brood of *Pararge egeria* was quite a week later than usual; I did not observe it until April 1st. Every autumn I breed a number of this species from ova, the imagines emerging during the winter and spring; but strangely these invariably produce the summer (dark) form. I suppose this is caused by being reared in a high temperature, *i. e.*, upon a shelf in my dining-room. The form I take at large in the spring has the light spots much enlarged, especially those surrounding the eye-spots upon the primaries.

The Heterocera, like the Rhopalocera, were very early upon the wing during the season of 1893, and general collecting commenced from the second week in March, but many species usually common were extremely scarce, of course with an occasional exception. I planted a large bed of *Nicotiana affinis* in anticipation of obtaining *Sphinx convolvuli*, but was sadly disappointed, as I only saw two or three; this species seems to be gradually getting scarce, very few records have been made of its capture for the last two seasons. I found a few larvæ of *Chærocampa elpenor* feeding upon willow-herb. The larvæ of *Smerinthus ocellatus* were plentiful upon sallows; also *Dicranura vinula*. *Macroglossa stellatarum* (two broods) was very abundant, especially in the autumn; I obtained several specimens in-doors flying against the window; they were all females, and doubtless were seeking a place for hybernating. *Hemaris bombyliformis* was also very common feeding upon blue-bells; and *H. fuciformis* more so than usual upon violets and primroses. From an old sallow stump I chiselled out from sixty to seventy pupæ of *Trochilium bembeciformis*, and there are many small larvæ still there. *Sesia asiliformis* larvæ and pupæ are to be found in oak stumps plentifully in the forest about April. I got a larva of *Zeuzera æsculi* from a twig of holly. Larvæ of *Cossus ligniperda* are playing havoc with the elms around here; I worked one tree and took many larvæ in their second year's growth, but the formic acid was almost unbearable, it nearly overpowered me, although *Vanessa atalanta* seemed to revel in it. *Drepana cultraria* was frequently seen among the beeches, but difficult to get; they rise from the shrubs and soar to the tree tops. *Sarothripa revayana* was scarce; *Earias chlorana* and *Chleophora* (*Hylophila*) *bicolorana*, fairly plentiful. Amongst rushes in the meadows I found a colony of *Nudaria senex*, at dusk, and took them freely; the males were pale yellowish brown, and the females slaty brown in colour. *Calligenia miniata* and *Lithosia rubricollis* were met with occasionally; but *L. griseola*, one specimen only. *Emydia cribrum* was fairly abundant the last week in May, and very dark; Mr. Taylor, of Bournemouth, discovered this species in abundance near that town, but quite a month later than I got it here. *Demas coryli*, from beech trunks, from April 17th, at Ridley wood. *Bombyx rubi* was very common, and upon the wing for a long time. *Euchelia jacobææ*, I have never seen the larvæ of this species so plentiful before; the ragwort was eaten in shreds almost everywhere around here. *Callimorpha dominula*, *Euthemonia russula*, *Chelonia villica*, fairly common. *Hepialus humuli* was double-brooded; I took a few on Sept. 26th, and saw some undulating over a sallow bush, one of which I netted. *H. hectus*, scarce. A few larvæ of *Notodonta chaonia* and pupæ of *Acronycta ligustri* were found. Larva of *Cymatophora ridens* undoubtedly was the commonest larva in the forest; by beating, every stroke brought them down in numbers; I got quite tired of them. *Tæniocampa miniosa*, ranking next; nearly all the oaks bordering the enclosures had one or two companies feeding under webs, and averaging about fifty larvæ in each. *Trachea piniperda* and *Tæniocampa munda*, common at sallows in March; the latter are all of the clay coloured form, whilst those from Brockenhurst are reddish,—a contrast, seeing the distance from here is only sixteen miles, and the surroundings almost identical. I bred out a few *Asteroscopus sphinx*. One of the best insects of the season was *Heliothis dipsacea;* I discovered a locality for it in June, and found it in abundance; my friend Mr. Bloomfield, of London, and I had excellent sport with this species; but what a wary insect to capture: the first one I saw fell an easy victim, not so with the other specimens in the good series I obtained; many a mile I tramped for them under a scorching sun. You quietly walk amongst the heaths and up starts an insect, pale in appearance, but for all the world like a *Plusia gamma* in all its habits: upon its first flight it usually settles within a few yards from whence it started; but each time you fail to capture, the flight gets longer, and I observed that in nearly every case, although it may lead you for nearly half a mile, it gradually works its way around and very near to the original place of starting. The best plan is to approach cautiously, and bending low, quickly glide the net over it; upon settling, it always selects an open space, and with quivering wings runs well up under a clump of heath. When the insect is under the net, it is best to lift the leno, as *H. dipsacea* immediately rises, and with the rapidity of *Macroglossa stellatarum*. I did not observe it after sundown; but about this time I have seen specimens get right out of sight into a clump of heath. *Leucania pallens* had a late brood; I took it from ivy in October; and in this way *Hadena protea* and *Agrotis puta* were both plentiful. *Uropteryx sambucata* produced two broods; I caught a rather small female at ivy, and at same time several larvæ also; rather unusual for both to appear together. *Epione advenaria*, more plentiful than usual. *Tephrosia biundularia* was well out by April 1st; and I did not observe *T. crepuscularia* until April 4th. The latter produced three district broods: the first, large; the second, medium; and the third, September, small and dark. *T. consonaria*, common, April 6th. *Boarmia cinctaria*, from March 29th to April 20th; and, later, *B. roboraria*, fairly common. *Himera pennaria*, abundant. On April 6th, *Selenia lunaria* appeared. *Hybernia leucophæaria*, from Jan. 27th to Feb. 27th. *Pachycnemia hippocastanaria*, from April 16th to the autumn, with a slight interval. *Lobophora viretata*, April 13th; and larvæ of *L. carpinata*, upon sallows in June and July, were plentiful; I also netted a few *L. sexalisata*. *Cidaria siderata*, in October, upon ivy. *Corycia temerata* and *C. taminata* were both common. Three fine specimens of *Aventia flexula* fell to my lot; one upon a black currant bush in my garden. *Botys hyalinalis* came to light (4). I found the larvæ of *Euchloë cardamines* upon plants of purple honesty in my garden, feeding upon the seed-heads. *Vespa crabro* was very abundant everywhere around here; the females, in March, were very large; neuters, during the summer; and males, later. In conclusion, to show what a remarkable spring that of 1893 was, the hawthorn was out in full bloom by April 16th; that and the blackthorn being in flower together, the hedges for miles around looked just as if a coating of snow lay upon them.—J. Hy. Fowler; Poulner, Ringwood, Feb. 1894.

Observations in North Middlesex, 1893.—The past entomological season, throughout England, has been chiefly remarkable for the uniform high temperature, prevalent from the earliest weeks of March. Here the sallows were in full flower on March 11th, while by the 23rd the hedges had everywhere assumed their spring foliage. On April 5th the birches were in leaf in Oxhey and Pinner Woods, the wild cherry-blossom at the same time being very abundant and fine. Cold winds during the second week in April rather checked the general advance, but on the 17th I noticed that most of the forest trees were green, and the grass in all the meadows was burnt up. How the drought developed, and continued practically until November, I need not add. The effect upon insect-life was everywhere apparent, the majority of species being at least three weeks before their normal time. In the list of observances and captures appended will be found several insects new to the Middlesex fauna, or at any rate not recorded in Mr. Cockerell's valuable Catalogue, published in the 'Entomologist' (vols. xxiv. and xxv.), and in my notes (xxvi. 57). The credit of these new discoveries is due to the diligence of Mr. George Wall, who has furnished me with an interesting list of Lepidoptera observed at Grims Dyke, the boundary estate of Middlesex at this point; but the greater number of his captures are represented by single specimens, so that it is impossible to judge of the relative abundance of the novelties enumerated. I have also included the captures of Mr. C. H. Peers, of Harrow-Weald Rectory, with Mr. Wall's and my own. Of the Rhopalocera, *Gonopteryx rhamni* was the first to put in an appearance on Feb. 19th, with *Vanessa urticæ* a few days later. On March 25th, a bright day with a cloudless sky, *Pieris brassicæ* and *P. rapæ* were about everywhere. *Euchloë cardamines* I did not see until April 23rd; but on May 6th, *Argynnis euphrosyne*, *Lycæna icarus*, *Polyommatus phlæas*, *Cœnonympha pamphilus*, *Nisoniades tages*, and *Syrichthus malvæ* (the latter literally in thousands), were flying in the meadows about Pinner Woods. After May, the butterflies were not much in evidence, except *P. phlæas*, which was extremely plentiful, the last entry in my note-book showing that it was still about on Oct. 29th. *V. atalanta*, too, was out early, and continued to be common down to Oct. 21st, when it suddenly disappeared; but of *V. io* I saw but a solitary hybernated specimen on March 30th; while *V. cardui*, usually an occasional visitor, was in the same way entirely wanting. The discovery of this neighbourhood by the speculative builder will, I fear, soon destroy some of the best collecting-grounds in Middlesex, hitherto almost as much *terra incognita* to London entomologists as to the more unwelcome bricks and mortar. But there is still plenty of room for exploration; and, so far as I can judge, as I never meet collectors, the county has by no means received its fair share of attention. During August and September both Mr. Peers and I were away. Subjoined is a complete list of species observed, those followed by a * being, I believe, additions to the already published lists of the county:—

Rhopalocera (15 species).—Pieris brassicæ, P. rapæ, P. napi, Euchloë cardamines, Gonopteryx rhamni, Argynnis selene, Vanessa urticæ, V. io, V. atalanta, Epinephele ianira, Cœnonympha pamphilus, Lycæna icaris, Syrichthus malvæ, Nisoniades tages, Hesperia sylvanus.

Heterocera (195 species).—February: Hybernia rupicapraria, H. leucophæaria. March: Asphalia flavicornis,* Tæniocampa gothica, T. incerta,

T. stabilis, T. gracilis, T. munda, T. pulverulenta, Gonoptera libatrix, Brephos parthenias,* Amphidasys strataria, Hybernia marginaria, Anisopteryx æscularia, Cidaria suffumata, Alucita hexadactyla. April: Spilosoma fuliginosa, Xylocampa areola, Rumia luteolata, Selenia bilunaria, Panagra petraria, Anticlea badiata, A. nigrofasciaria, Coremia unidentaria. May: Chœrocampa porcellus, Macroglossa stellatarum, (Oct. 11th to 14th) Euchelia jacobææ, Hepialus humuli, H. lupulinus, Procris statices, Spilosoma mendica, Acronycta psi, Leucania comma, Xylophasia rurea, Apamea basilinea, A. gemina, Miana strigilis, M. bicoloria, Grammesia trilinea, Caradrina taraxaci, Agrotis exclamationis, A. segetum, A. corticea, Noctua rubi, Hadena thalassina, Euclidia glyphica, E. mi, Heliaca tenebrata, Triphæna pronuba, Zanclognatha tarsipennalis, Hypena proboscidalis, Selenia tetralunaria, S. lunaria, Venilia macularia, Odontopera bidentata, Tephrosia biundularia,* Iodis lactearia, Cabera pusaria, C. exanthemata, Ligdia adustata, Lomaspilis marginata, Emmelesia albulata, E. decolorata, Eupithecia lariciata, E. centaureata, E. castigata, Thera variata, Melanthia ocellata, Melanippe sociata, M. montanata, M. fluctuata, Coremia designata, C. ferrugata, Camptogramma bilineata, Cidaria corylata, C. truncata, C. immanata,* Eubolia plumbaria, Botys hyalinalis. June: Nola cucullatella, Spilosoma lubricipeda, S. menthastri, Zeuzera pyrina, Porthesia similis, Bombyx rubi, B. neustria, Notodonta camelina, Phalera bucephala, Thyatira derasa, Leucania conigera, L. pallens, Xylophasia lithoxylea, X. monoglypha, X. hepatica, Neuria reticulata, Dipterygia pinastri, Mamestra brassicæ, Apamea didyma, Miana fasciuncula, M. literosa, M. arcuosa, Caradrina morpheus, Rusina tenebrosa, Noctua augur, N. plecta, N. triangulum, N. brunnea, N. festiva, Mania typica, Euplexia lucipara, Hadena oleracea, Plusia iota, P. pulchrina, P. gamma. Oct. 21st: Phytometra viridaria, Uropteryx sambucaria, Metrocampa margaritaria, Pericallia syringaria, Boarmia repandata, B. gemmaria, Pseudoterpna pruinata, Hemithea strigata, Acidalia bisetata, A. virgularia, A. aversata, Timandra amataria, Abraxas grossulariata, Larentia didymata, L. viridaria, Eupithecia rectangulata, Hypsipetes sordidata, Cidaria populata,* C. fulvata, C. dotata, Eubolia limitata, Pyralis glaucinalis, Eurrhypara urticata, Botys fuscalis, Aciptilia pentadactyla. July: Orgyia antiqua, Hydrœcia nictitans, Leucania impura, Caradrina quadripunctata, Agrotis nigricans, Noctua baia, N. xanthographa, Amphipyra pyramidea, A. trogopogonis, Calymnia trapezina, C. diffinis, C. pyralina, Catocala nupta, Crocallis elinguaria, Geometra papilionaria, Phorodesma pustulata, Cidaria miata, Scotosia rhamnata, Aglossa pinguinalis, Pyralis costalis, Achrœa grisella. Aug.: Asphalia diluta, Cerigo matura, Agrotis suffusa, Noctua c-nigrum, Xanthia fulvago, X. circellaris, Phylogophora meticulosa, Macaria liturata, Cidaria testata. Sept.: Neuronia popularis, Agrotis puta, Orthosia lota, O. macilenta, Anchocelis rufina, A. pistacina, A. lunosa, A. litura, Cerastis vaccinii. (March 22nd) Scopelosoma satellitia, (Feb. 11th) Xanthia citrago, X. flavago, X. aurago, X. gilvago, Polia flavicincta, Miselia oxyacanthæ, Agriopis aprilina, Hadena protea, Epione apiciaria. Oct.: Calymnia affinis, Himera pennaria, Hybernia defoliaria, Oporabia dilutata. Nov.: Cerastis spadicea, Hybernia aurantiaria, Cheimatobia brumata.—H. Rowland Brown: Oxhey Grove, Harrow-Weald, Middlesex, Jan. 14th, 1894.

The Mild Season.—I can give an earlier date for *Phigalia pedaria*, and from the North of Scotland, than any that have yet appeared in the

'Entomologist.' On Dec. 27th, my brother brought me a fine female specimen, which he had found in the Logie woods. He brought me another on Jan. 7th, from the same locality.—WM. REID; Pitcaple, N.B., March 5th, 1894.

On the 24th inst. my brother took a very good specimen of *Phlogophora meticulosa*, on some palings in the high road here. The moth was very lively when boxed. Can this be a hybernated specimen, or one of the early brood?—HERBERT C. GENTRY; 22, Goulton Road, Lower Clapton, N.E., Feb. 26th, 1894.

I found a male *Phigalia pilosaria* (*pedaria*), on Jan. 7th, on a lamp-post in Ealing.—R. S. ST. JOHN; Duncliffe, Hanger Lane, Ealing, W., Feb. 27th, 1894.

I see in the 'Entomologist' for February (*ante*, p. 71) the report of an early capture of *Phigalia pedaria*. I had the pleasure of taking a specimen of this species, on a lamp in Sherwood Rise, on Jan. 13th. The weather was very mild then, and I have had *Endromis versicolor* and *Asphalia flavicornis* come out in the breeding-cage this week, which I think very unusual.—THOS. A. CARLYON; Connemara House, Alexander Street, Sherwood Rise, Nottingham, Feb. 17th, 1894.

LEPIDOPTERA AT LIGHT IN SUFFOLK IN 1893.—I was interested in reading the remarks on captures at light made last year by an Ipswich correspondent (*ante*, p. 26), and can fully endorse the statement as to the prevalence of *Noctua c-nigrum*, of which my first capture is recorded on May 8th. There was a noticeable decrease in the numbers of *Plusia gamma* as compared with 1892, and the same may be said of *Thyatira derasa* and *Triphæna pronuba*. The "glorious" evenings at ivy and sallow last year might be called a fraud. Lamps at early morning, during May, were very productive, but after that time results were not so satisfactory, presumably owing to the increase of the feathered visitants, as I noticed numbers of swallows and other birds fly off the lamps on approaching. On May 13th, from 4.30 a.m., I captured the following:—*Smerinthus populi*, *Euchelia jacobææ* (6), *Pygæra bucephala* (2), *Orgyia pudibunda* (1), *Arctia lubricipeda* (2), *A. menthastri* (7), *Rumia cratægata* (2), *Hemerophila abruptaria*, and *Cilix spinula* (2). *E. jacobææ* came as a pleasant surprise, as I was not aware of its being attracted to light. On May 15th I caught another solitary specimen out of about seventy suburban lamps visited, other captures being chiefly *A. lubricipeda* and *A. menthastri*. On May 16th I added *Cymatophora diluta*. I may mention that I captured two specimens of *Biston hirtaria* on April 12th, and one example on Dec. 27th.—CLAUDE A. PYETT; Thornley Place, 28, Waterloo Road, Ipswich, Jan. 24th, 1894.

DRAGONFLIES IN THE CHESTER DISTRICT.—The three following species are now added to the list for the Chester district (Entom. xxvi. 35):—*Æschna cyanea*, one of the largest species, with two large yellow oval spots on front of thorax; *Platetrum depressum* (Entom. xxvi. 288); and *Calopteryx splendens*, with head, thorax, and body iridescent peacock-green, the males having on all the wings a very wide smoky black blotch, central, but situated nearest the outer margin, this blotch usually extending from the costal to the inner margin; females without the blotch, and wings usually with a green tint. Total, 17 species out of the British total of, say, 37.—J. ARKLE; Chester.

Argynnis selene in Jersey.—On Aug. 19th, 1893, Mr. J. Norman, an entomologist of this island, had the good fortune to take a fritillary, afterwards identified by Mr. Luff, of Guernsey, as a small specimen of *Argynnis selene*. I was with him at the time of the capture, and saw the insect before he succeeded in netting it. It was flying over a bed of yellow iris, on the borders of a small stream in a valley at Rozel. This is an important capture, as *A. selene*, although common in England, had never before been observed in Jersey, or indeed any of the Channel Islands.—**Stanley Guiton**; 31, Bath Street, Jersey.

SOCIETIES.

Entomological Society of London.—*February 7th*, 1894. Henry John Elwes, Esq., F.L.S., President, in the chair. The President announced that he had nominated the Rt. Hon. Lord Walsingham, LL.D., F.R.S.; Professor Edward B. Poulton, M.A., F.R.S.; and Colonel Charles Swinhoe, M.A., F.L.S., Vice-Presidents of the Society for the session 1894–95. Mr. Walter F. Baker, of 18, Hyde Terrace, Leeds; Mr. Percy M. Bright, of Roccabruna, Bournemouth; Professor Lewis Compton Miall, F.R.S., of the Yorkshire College, Leeds; and Mr. Edwin Wilson, of Cherry Hinton Road, Cambridge, were elected Fellows of the Society. Mr. Jenner Weir exhibited, on behalf of Mr. J. M. Adye, a specimen of *Plusia moneta*, Fabr., which had been captured at Christchurch, Hants, and remarked that this species, which had been found in this country for the first time so recently as June, 1890, was apparently becoming a permanent resident here, as it had been since taken in several of the southern counties. The food-plant, *Aconitum napellus*, though rare in England as a wild plant, was very common in gardens. Mr. Jenner Weir also exhibited a nearly black specimen of *Venilia macularia*, L., the yellow markings being reduced to a few small dots. Mr. Hamilton Druce exhibited a female specimen of *Hypochrysops scintillans*, lately received by him from Mioko, New Ireland. He said that only the male of this species had been as yet described. Mr. F. Enock exhibited a nest of the British Trap-door Spider, *Atypus piceus*, recently found near Hastings by Mrs. Enock. Mr. W. F. H. Blandford stated that he had recently obtained an additional species of *Scolyto-platypus* from Japan, which, though closely allied to the species he had formerly described, showed a very distinct modification of the male prosternum. Mr. M. Jacoby exhibited and remarked on a specimen of *Leptispa pygmæa*, Baly, which was doing much injury to sugar-cane in the Bombay Presidency of India. Mr. G. C. Champion stated that he had found an allied species on bamboo. Dr. F. A. Dixey read a paper—which was illustrated by the oxyhydrogen lantern—entitled "On the Phylogeny of the *Pierinæ* as illustrated by their wing-markings and geographical distribution." A long discussion ensued, in which the President, Mr. Osbert Salvin, Mr. Jacoby, Colonel Swinhoe, Mr. Jenner Weir, Mr. Hampson, and Mr. Kenrick took part. Dr. T. A. Chapman read a paper entitled "Some notes on those species of Micro-Lepidoptera, allied to *Micropteryx*, whose larvæ are external feeders, and chiefly on the early stages of *Eriocephala calthella*." Mr. Hampson and the President made some remarks on the subject of the paper. Mr. Hamilton H. Druce read a paper entitled "Description of the female of *Hypochrysops scintillans*, Butl." The Rev. Dr. Walker communicated a paper by Mr. R. H. F. Rippon, entitled "Description of a variety of *Ornithoptera* (*Priamoptera*) *urvilliana*."

Feb. 28*th*.—Colonel Charles Swinhoe, M.A., F.L.S., Vice-President, in the chair. Professor August Forel, M.D., of the University of Zürich, was elected an Honorary Fellow of the Society, to fill the vacancy caused by the death of the late Professor H. A. Hagen, M.D. Mr. John Pratt, of the Cedars, New Barnet, and Mr. Michael Yeatman Woolf, of 1, Marlborough Place, St. John's Wood, N.W., were elected Fellows of the Society. Mr. G. C. Champion called attention to a supposed new Longicorn beetle, described and figured by Herr A. F. Nonfried, of Rakonitz, Bohemia, under the name of *Callipogon friedländeri*, in the Berl. Ent. Zeitschr. 1892, p. 22. He said that the supposed characters of the insect were due to the fact that the head had been gummed on upside down! He also exhibited an extensive collection of Coleoptera and Hemiptera-Heteroptera made by himself in the island of Corsica in May and June last. The Rev. Theodore Wood exhibited a variety of *Saturnia carpini*, with semi-transparent wings, a large proportion of the scales being apparently absent, bred with several examples of the type-form at Baldock, Herts; also a pale variety of *Smerinthus populi*, which was said to have been bred, with several similar specimens, from larvæ marked with rows of red spots on both sides. Mr. R. South exhibited a variety of *Argynnis aglaia*, approaching the form known as var. *charlotta*, and a variety of *Euchelia jacobææ*, in which the crimson costal streak was continued along the outer margin almost to the inner margin, taken by Mr. Fowler at Ringwood, Hants, in 1893; a variety of *Argynnis euphrosyne*, taken by Mr. Mead in Epping Forest in 1893; and a series of black and other forms of *Phigalia pedaria*, bred during the present year from a black female captured last year by Mr. Rose, of Barnsley. Mr. H. Goss exhibited, for Mr. C. B. Taylor, of Jamaica, a beautifully coloured drawing of the larva of *Papilio homerus*, Fab. Mr. F. W. Frohawk exhibited drawings showing the complete life-history of *Argynnis aglaia* and *A. adippe*, every stage being figured; also enlarged drawings of the segments of the larvæ in their first and last stages, showing the remarkable difference in structure. Mr. Merrifield commented on the beauty of the drawings. Mr. G. C. Champion read a paper entitled "On the *Tenebrionidæ* collected in Australia and Tasmania by Mr. J. J. Walker, R.N., during the voyage of H.M. Ship 'Penguin,' with descriptions of new genera and species"; and he exhibited the specimens comprised in the collection. Mr. J. J. Walker and Colonel Swinhoe made some remarks on the paper. Mr. Champion also read a paper entitled "An Entomological Excursion to Corsica," in which he described an expedition to the mountains of that island in May and June, 1893, in company with Mr. R. S. Standen, Mr. A. H. Jones, Colonel Yerbury, R.A., Mr. Lemann, Mr. Raine, and others. Mr. Osbert Salvin, Colonel Yerbury, and Colonel Swinhoe took part in the discussion which ensued. Mr. Edward Saunders communicated a paper entitled "A List of Hemiptera-Heteroptera collected by Mr.

Champion in Corsica, with a description of one new species." Mr. W. F. Kirby read a paper entitled "Notes on *Dorydium westwoodi*, Buchanan White, with observations on the use of the name Dorydium." Mr. Charles B. Taylor communicated a paper entitled "Description of the larva and pupa of *Papilio homerus*, Fab."

March 14*th*. — Colonel Charles Swinhoe, M.A., F.L.S., Vice-President, in the chair. Mr. William Bateson, M.A., Fellow of St. John's College, Cambridge; Mr. H. Caracciolo, of the Port of Spain, Trinidad; Mr. G. Dudgeon, of 53, Montague Square, W.; and the Rev. Frank E. Lowe, M.A., of St. Stephen's Vicarage, Guernsey, were elected Fellows of the Society. Dr. D. Sharp, exhibited a collection of white ants (*Termites*) formed by Mr. G. D. Haviland in Singapore, which comprised about ten or twelve species, of most of which the various forms were obtained. He said that Professor Grassi had recently made observations on the European species, and had brought to light some important particulars; and also that, in the discussion that had been recently carried on between Mr. Herbert Spencer and Professor Weismann, the former had stated that in his opinion the different forms of social insects were produced by nutrition. Professor Grassi's observations showed this view to be correct, and the specimens now exhibited confirmed one of the most important points in his observations. Dr. Sharp also stated that Mr. Haviland found in one nest eleven neoteric queens,—that is to say, individuals having the appearance of the queen in some respects, while in others they are still immature; these neoteric queens were accompanied by kings in a corresponding state. Mr. Haviland gave an account of the structure of some of the nests, and of the cells of the females, and stated that two of the species of white ants exhibited certainly grow fungus for their use, as described by Mr. Smeathman, many years ago, in the Phil. Trans. of the Royal Society. Mr. H. Goss remarked that the fact that the different forms of social insects were produced by nutrition was known to Virgil, who referred to it, and to the subject of Parthenogenesis in bees, in the 'Georgics,' Book iv. Mr. McLachlan, Colonel Swinhoe, Mr. Champion, Mr. Jenner Weir, and Dr. Sharp continued the discussion. Mr. O. E. Janson exhibited specimens of *Dicranocephalus adamsi*, Pascoe, from Sze-chuen, Western China, and *D. dabryi*, Auz., recently received from the neighbourhood of Moupin, in the same district; he observed that, although the latter had been quoted by Lucas, Bates, and others, as a synonym of *adamsi*, the two species were perfectly distinct; the females of both were unknown to the authors when describing them, and presented a remarkable difference, for whilst in *dabryi* this sex is similar to the male in colour and sculpture, in *adamsi* it is entirely dull black, with the upper surface minutely and densely punctate. Mr. C. O. Waterhouse exhibited, for Mr. E. A. Waterhouse, a specimen of *Colias edusa*, closely resembling *C. erate*, a continental species, which was taken on Wimbledon Common; a varied series of *Chrysophanus phlæas* from Barnes Common; and a series of *Lycæna arion*, from Cornwall. The Rev. Canon Fowler read a paper entitled "Some new species of *Membracidæ*." Mr. F. Merrifield read a paper entitled "Temperature experiments in 1893, on several species of *Vanessa* and other Lepidoptera." He said that the results tended to confirm Dr. Dixey's conclusions as to the origin of the wing-markings in the *Nymphalidæ*, brought out many, presumably, ancestral features, and in some cases were very striking. There was much difference in sensitiveness between the seasonal broods of the same species, even in *V. c-album*, although both broods of that species passed the pupal state in the warmer part of the year. Dr. F. A. Dixey read a paper entitled "On Mr. Merrifield's experiments in temperature-variation as bearing on theories of heredity," which was supplemental to the previous paper. Colonel Swinhoe, Mr. Hampson, Mr. Jenner Weir, Mr. Merrifield, and Dr. Dixey took part in the discussion which ensued.—H. Goss & W. W. Fowler, *Hon. Secretaries.*

South London Entomological and Natural History Society.—*Annual Meeting, January 25th*, 1894. J. Jenner Weir, Esq., F.L.S., President, in the chair. This being the Annual Meeting, no exhibits were made, the occasion being devoted to hearing the Treasurer's and Council's Reports and the Address of the retiring President. The President presented a handsome album to the Society, containing three photographs of himself, taken at different ages, and said he hoped that all the members would contribute their own, as such a collection would, in the future, probably be of great interest and value. The following gentlemen were then elected officers for the ensuing year:—President, Mr. E. Step; Vice-Presidents, Mr. J. Jenner Weir, F.L.S., and Mr. C. G. Barrett, F.E.S.; Treasurer, Mr. R. Adkin, F.E.S.; Librarian and Report Secretary, Mr. Hy. J. Turner, F.E.S.; General Secretary, Mr. S. Edwards, F.L.S.; Curator, Mr. W. West; Council, Messrs. T. R. Billups, F.E.S., C. A. Briggs, F.E.S., J. H. Carpenter, F. E. Filer, F. W. Frohawk, F.E.S., J. Henderson, and R. South, F.E.S. In his address the President showed fully the pleasures and advantages derived from the study of entomology. He spoke of the recent attention which had been given to classification, noticing especially the admirable work of Dr. Chapman, and made considerable reference to melanism, coupling therewith the results of the laborious experiments of Mr. Merrifield. After discussing at length the exceptional season and its effects on Lepidoptera, he remarked with satisfaction upon the "new life which the study of Variation had given to the collecting of indigenous Lepidoptera." A graceful reference to the late Mr. H. T. Stainton, as one who, "being dead, yet speaketh," and words of welcome to the incoming President, Mr. E. Step, ended a most able address.

February 8*th*.—E. Step, Esq., President, in the chair. Mr. Carpenter exhibited *Xylophasia monoglypha*, Hufn. (*polyodon*, L.), both the dark and intermediate forms; also a form of *Agrotis cursoria*, Bork., not distinguishable from a southern form of *A. tritici*; all from Aberdeen. Mr. W. F. Warne, a case of nearly two dozen species of Rhopalocera taken near Rockhampton, in Queensland, representing one morning's captures; they included *Anosia plexippus* and *Deiopeia pulchella*, L. Mr. W. A. Pearce, series taken by himself in Alleghany, U.S.A., during 1892–3, *Pyrameis atalanta*, L., *P. huntera*, Fab., *Vanessa antiopa*, L., *Polygonia interrogationis*, Fab., *P. comma*, Harr. (the two broods), and bred series of *Telea polyphemus*, L., and *Samia cecropia*, L. A discussion ensued as to the singularity of a species like *V. antiopa* being gregarious in the larval stage, while the imagines were seldom met with in company. Mr. R. Adkin, examples of *Crambus ericellus*, Hb., *C. dumetellus*, Hb., *C. pratellus*, L., *C. myellus*, Hb., *C. pinellus*, L., *C. furcatellus*, Zett., and *C. margaritellus*, Hb., and pointed out characters by which the closely allied species might be easily separated. Mr. Dennis, a specimen of *Vanessa io*, L., with a small additional ocellus on each secondary, while below the central costal blotch on the primaries was a smaller dark blotch. Mr. H. Williams, specimens of *Pieris brassicæ*, L., curiously tinted from contact with liquid ammonia. Mr. J. Jenner Weir, on behalf of Mr. Adye, a specimen of *Plusia moneta*, taken at Christchurch in 1893, and a nearly black specimen of *Venilia macularia*, L., from the New Forest; also, on behalf of himself, *Eucheira socialis*, Westw., perhaps the most archaic form of the Pierine sub-family extant, and contributed notes. Mr. Frohawk, a bred series of *Argynnis euphrosyne*, L., which has been nearly eleven months in the larval stage. Mr. Billups, on behalf of Mr. Sauzé, a large number of Diptera captured in 1893.

February 22*nd*.—The President in the chair. Mr. South, for Mr. Rose, of Barnsley, exhibited a long bred series of *Phigalia pedaria*, Fb., some being uniformly black without a trace of markings; for Mr. Fowler, of Ringwood, a beautiful variety of *Argynnis aglaia* which was a modification of the form known as *charlotta*, Sowerby; and a var. of *Euchelia jacobææ*, L., having the costal stripe carried round the hind margin to meet the spot; for Mr. Dennis, of York, photographs of very long series of *Spilosoma lubricipeda*, Esp., ranging from very pale and almost spotless to very deep coloration; and a photograph of three other vars. from the Allis collection, from York, of which two were undoubtedly of the *zatima* form, although not extremes; also several rare vars. of *Argynnis euphrosyne*, L. Mr. Frohawk, coloured drawings representing the complete life-history of both *A. aglaia*, L., and *A. adippe*, L., with details enlarged to show the remarkable larval structure. Mr. Warne, an asymmetrical specimen of *Abraxas grossulariata*, L. Mr. Moore, several cases of all orders, containing specimens collected on a bicycle tour from Dieppe through Paris, Cote d'Or, and Jura to Geneva, and in Guienne, and contributed notes. Mr. Pearce, series of *Feniseca tarquinius*, Fab., spring and summer broods of *Lycæna pseudargiolus*, Bd., *L. comyntas*, Godt., and *Thecla edwardsii*, Saund., from Pennsylvania, U.S.A. Mr. Auld, for Mr. Tugwell, to correct an error in the report of Jan. 11th; series of the York city form of *Spilosoma lubricipeda*, Esp., for which he suggests the name var. *eboraci;* series of var. *zatima*, Cr.; and series of the selected brood originating from Yorkshire, for which he suggests the name var. *fasciata* [*ante*, p. 96]. A discussion ensued as to variation produced by artificial selection. Mr. Jenner Weir exhibited a new butterfly from North Eastern Borneo, which he had described under the name of *Caduga crowleyi* [*ante*, p. 109]. Mr. Lewcock sent for exhibition a box of Coleoptera to illustrate a paper he communicated, describing his observations during the various excursions of the Society. Mr. Mansbridge communicated a paper containing his observations in the United States, entitled "Notes from the Indian Territory." Remarks were made on the increase of melanism in insects, and a discussion ensued.

March 8*th*.—The President in the chair. Mr. R. Adkin exhibited a series of *Erebia epiphron*, Knoch. var. *cassiope*, Fb., from Inverness, which were said to be of the type form (*epiphron*); he had, however, failed to detect the white pupil to the ocellated spots, which was the typical character. Mr. Weir said that the British form had no trace of the white pupil. Mr. Routledge, specimens of a brood of *Selenia bilunaria*, Esp., which had lain over the summer of 1892, emerging in April, 1893; also individuals bred from a pair of the latter, which had emerged at intervals from Aug., 1893, to Feb., 1894, and were all of the small form, although some had the pigment well developed; he also brought a series of *Epunda lutulenta*, Bork., captured in Cumberland, among which were both the var. *sedi*, Gn., and the var. *luneburgensis*, Frr. Mr. South, exceedingly large female specimens of *Ocneria dispar*, L., bred upwards of thirty years ago from larvæ obtained in the fens; he thought these specimens had originally belonged to the late Mr. Standish, and Mr. Weir said that they agreed in the setting with examples in his own collection which he had received from Mr. Standish. Mr. Frohawk, a third brood of *Pararge megæra*, L., ten males and ten females, bred by himself from ova deposited on Aug. 2nd, 1893. Mr. Billups, three species of rare Ichneumonidæ, viz., *Microgaster russatus*, Hal., taken at High Beech in 1884; *Hyperacmus crassicornis*, Gr., of which only one recorded specimen was known, taken at Oxshot in 1892; and *Euryproctus nemoralis*, Fov., taken at the same place last July. Mr. Filer, a series of *Hybernia leucophæaria*, Schiff., taken at Richmond and Epping, among which were some exceptionally dark forms. Mr. W. A. Pearce, specimens of *Attacus luna*, L., and *Citheronia regalis*, F., from Wilkinsburg, U.S.A. Mr. Jenner Weir, male and female *Heteronympha merope*, Fab., and stated that the sexes were so totally unlike as to be deemed different species until quite recently; he also said that the chrysalis was said to be contained in a frail network on the ground. Mr. Auld, on behalf of Dr. Knaggs, a working model of the decoy and net described in the 'Entomologist,' 1893, and a considerable discussion ensued. Mr. Step stated that he had found that the flowers of the butcher's broom (*Ruscus aculeatus*, L.), were produced in pairs on the phylloclade, but only one bud opened at a time.—HY. J. TURNER, *Hon. Report Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*January* 15*th*, 1894. Mr. R. C. Bradley in the chair. Exhibits:—By Mr. G. T. Bethune Baker, *Agrotis ravida* from Wicken, and three specimens of *Tapinostola extrema*, Hb. (*concolor*, Gn.), taken near Wicken by Albert Houghton; also a collection of Lepidoptera received from Alexandria; he said that the species showed a mingling of Mediterranean with Indo-Persic forms; there were no true Ethiopian forms amongst them; twenty-two of the species were new to science, and it was perhaps the largest collection yet received from Egypt. By Mr. Bradley, specimens of *Andræna fulva* and *A. cineraria*, which had been dug out of nests at Sutton by railway men on Dec. 28th, a date when they should have been in pupæ; he had communicated with Mr. Saunders, who said that the only similar case of which he knew was that Mr. Enock had dug up an *Andræna*, with a parasitic *Nomada*, once in December.

February 5th. — *Annual Meeting.* Mr. R. C. Bradley in the ch
Mr. W. Bowater, of Portland Road, Edgbaston, was elected a mem
Reports of the Treasurer and Council were presented, the for
showing a small balance in hand. The officers and council for 189
were elected as follows:—President, Mr. G. H. Kenrick; Vice-Presid
Mr. G. T. Bethune Baker; Treasurer, Mr. R. C. Bradley; Librari
Mr. A. H. Martineau; Hon. Secretary, Mr. Colbran J. Wainwri
147, Hall Road, Handsworth; and remaining members of Coun
Messrs. P. W. Abbott and W. Harrison. Exhibits:—By Mr. P.
Abbott, a short series of *Acidalia humiliata* from the Isle of Wight,
of which he took in 1891, the remainder being sent to him by
A. J. Hodges; also *Caradrina superstes* from Guernsey; he said th
specimen of this species had been taken at Sandown, Isle of Wi
last autumn, by Mr. Prout; also *Hadena dentina* from Sutton and
of Wight, the former a particularly dark specimen, the latter a ch
cliff form, very pale and quite unlike the dark one in appearance;
a specimen of *Lobophora viretata* from Sutton, very small and p
without the median bands; and other interesting insects. By
A. H. Martineau, workers of *Myrmica rufa* and *M. sanguinea*; of
latter rare ant he had found a nest in Wyre Forest. By Mr. R
Bradley, *Gonia lateralis* from Trench Woods. By Mr. W. Harris
Lycæna argiolus and *Halias prasinana* from Frankley, near Harbo
&c.—Colbran J. Wainwright, *Hon. Sec.*

Lancashire and Cheshire Entomological Society.—*February* 1
1894. Mr. S. J. Capper, F.L.S., F.E.S., President, in the ch
Miss E. H. Lea, Kirby Park, West Kirby, and Mr. Frederick R
64, Mount Pleasant, Liverpool, were elected ordinary members of
Society. Mr. Robert Newstead read a paper entitled "Correlation
Plants and Insects," in which he discussed the fertilisation of
Yucca, and explained the process as described by Prof. C. V. Rile
'Insect Life,' and added notes from his own observations on
insects frequenting the flowers in this country. He also gave notes
the gall-making Brachyscelidæ of Australia, a group of Coccidæ pecu
to that country. He also called attention to the galls of *Dipl*
rumicis, Linn., and suggested that it is quite possible botanists h
described malformed "tubercles" of some species of *Rumex*, as he
found a great number of "tubercles" abnormally swollen by
species. The paper was illustrated by diagrams and specim
including a specimen of gall-making coccids from Australia.

March 12th.—The President in the chair. Mr. W. E. Sharp
a brief description of the British species of the genus *Silpha*,
ticularly those of local occurrence, in the course of which he quote
extract from the 'Transactions' of the Société de Biologie of Pari
Prof. A. Giard on *Silpha opaca*, an insect most destructive to
French beet-root crops. The notes were illustrated by specimen
the genus. Miss E. H. Lea exhibited varieties of *Cidaria psitti*
and *C. miata*; Mr. John Lea, large specimens of *Cidaria sagittata*;
John Watson exhibited *Meganostoma cæsonia*, *Catopsilia crocea*, *C*
vautieri, and *C. fieldii*.—F. N. Pierce, *Hon. Sec.*

Reading Natural History Society.—The usual monthly mee
of this Society was held on Thursday, Feb. 1st, at 8 p.m., in

Robert Hewett's room, St. Mary's Churchyard. No paper was read, but a variety of interesting Natural History specimens were exhibited, among which were the series of varieties, about fifty in number, of *Arctia caia*, shown by Mr. W. E. Butler, and a drawer of Micro-Lepidoptera, beautifully mounted, by Mr. A. H. Hamm.—FRED. W. LESLIE, *Hon. Sec.*

RECENT LITERATURE.

The Butterflies and Moths of Teneriffe. By A. E. HOLT WHITE. Edited by RASHLEIGH HOLT WHITE, Vice-President of the Selborne Society. Illustrated from the Author's drawings. London L. Reeve & Co. 1894 [Dec. 19, 1893].

MRS. HOLT WHITE has rendered a real service to entomologists, as well as to tourists or invalids interested in insects, who may visit the Canary Islands, in publishing a fairly complete and reliable, though popular, account of the Macro-Lepidoptera of Teneriffe, most of which are illustrated on the four plates which accompany this volume; for the fauna is very limited. The introductory observations on collecting, rearing, &c., are useful, and the transformations of the various species are noticed, as far as they have been observed. Several species are figured in this book for the first time, and a detailed account is given of the interesting and little-known Arctiid, *Rhyporioides rufescens*, Brullé, which is peculiar to the Canaries, in all its stages.

The Atlantic islands are very poor in Lepidoptera, and much remains to complete our knowledge on the subject, especially in the Micro-Lepidoptera, notwithstanding Rebel's recent paper in the 'Annalen d. k. k. naturhist. Hofmuseums,' vii., pp. 241–284, pl. xvii. The most complete lists are as follows:—

	Macros.	Micros.	Total.
Azores (Godman) (Nat. Hist. Azores; 1870.)	23	5	28
Madeira (Bethune-Baker) (Trans. Ent. Soc. 1891.)	70	—	70
Canaries (Holt White & Rebel)	64	63	127
St. Helena (Mrs. Wollaston) (Annals and Mag. of Nat. Hist., ser. 5, vol. 3; 1879.)	30	64	94

We have thought it useful to give a comparative table of the Macro-Lepidoptera (inclusive of Deltoides and Geometridæs, but not Pyralidæs) of the three first groups of islands. St. Helena lies so much further to the south, and so many of its species are probably endemic, that it must be regarded as belonging to a totally different fauna; but in our table we have marked any species likewise found in that island with an asterisk. The only butterfly of the four found in St. Helena not in our table is *Hypolimnas misippus*, and it is this butterfly, and not *Danais chrysippus*, which is found in America in the localities assigned by Mrs. Wollaston to the latter butterfly. Only three Sphinges are recorded from St. Helena, and no Bombyces; indeed the scarcity of Bombyces in all the Atlantic islands is specially remarkable.

	Azores	Madeira	Canaries
RHOPALOCERA (Butterflies).			
Pieris brassicæ	+		
wollastoni		+	+
cheiranthi			+
rapæ	+		+
napi	+		
daplidice	+		+
Aporia cratægi			+
Euchloe charlonia			+
Rhodocera maderensis		+	
cleobule			
Colias edusa	+	+	+
v. helice		+	+
Danais archippus	+		+
* chrysippus			+
v. alcippoides			+
v. klugii			+
Argynnis maia			+
lathonia		+	+
Pyrameis atalanta	+	+	+
callirhoe		+	+
* cardui	+	+	+
huntera			+
Pararge xiphia		+	
xiphioides			+
Epinephele janira	+		
v. hispulla			+
*Hipparchia statilinus	(?)		+
maderensis		+	
Thecla rubi			+
Polyommatus phlœas		+	+
*Lycæna bætica		+	+
webbiana			+
astrarche			
var. æstiva			+
bysimon			+
Hesperia actæon			+
HETEROCERA (Moths).			
Sphinges.			
Macroglossa stellatarum	+	+	+
*Chœrocampa celerio			+
Daphnis nerii	+		
Deilephila livornica		+	
lineata			?
tithymali		?	+
lathyrus		?	
Sphinx ligustri	+		? (Webb)
convolvuli	+	+	+
v. botatæ			+
*Acherontia atropos	+	+	
Bombyces.			
Deiopeia pulchella		+	+
Rhyparioides rufescens			+
Dasychira fortunata			+
Noctuæ.			
Bryophila ravula			+
algæ			+
maderensis		+	
Sesamia nonagrioides		+	+
Triphæna pronuba		+	+
orbona			? (Webb)
Agrotis spinifera		+	+
saucia	+	+	+
(* [illegible]etum	+		

	Azores	Madeira	Canaries
Hecatera maderæ		+	
Epunda albosignata		+	
Hadena atlanticum		+	
Eriopus latreillii		+	
*Prodenia littoralis		+	+
Phlogophora periculosa		+	
v. brunnea		+	
wollastoni		+	
Nyssocnemis dubiosa		+	
Nonagria sacchari		+	+
*Leucania extranea	+	+	+
Caradrina quadripunctata		+	
exigua		+	
Calymnia (?) ferruginea		+	+
Calocampa exoleta			+
Cucullia chamomillæ		+	
*Plusia aurifera		+	+
chalcitis		+	
gamma	+	+	
chrysitis			? (Webb)
circumflexa		+	+
eriosoma			+
tripartita			+
Heliothis armiger		+	+
peltiger		+	+
dipsacea			+
Heliaca tenebrata			+
Arontia lucida		+	+
Thalpochares ostrina		+	
v. æstivalis		+	+
(* ?) Cosmophila erosa			+
*Pseudophia tirhaca			+
Spintherops dilucida		+	
Hypena lividalis		+	+
obsitalis	+	+	+
*Hypenodes costæstrigalis		+	
Geometræ.			
Nemoria nubigena		+	
Acidalia maderæ		+	
dimidiata		+	
atlantica		+	
unistrigata		+	
zargi		+	
wollastoni		+	
irrorata		+	
consolidata			+
guancharia			+
Zonosoma pupillaria		+	+
maderensis		+	
Hemerophila maderæ		+	
Boarmia wollastoni		+	
var. obscura		+	
Tephronia sepiaria			+
Eubolia rupicola		+	
Aspilates collinaria			+
*Sterrha sacraria		+	+
Omphacodes divincta			+
Camptogramma fluviata	+		
Phibalap. polygrammata	+		
Coremia centrostrigaria		+	
Cidaria fasciata		+	
Eupithecia pumilata			+
insulariata		+	
bicoloria		+	
Centra stregaria			+

From a photograph by Maull & Fox, Piccadilly, W.

Yours very truly

[illegible]

JOHN JENNER WEIR,

DIED ON MARCH 23rd, 1894, IN HIS 72nd YEAR.

ESTEEMED BY ALL.

THE ENTOMOLOGIST

Vol. XXVII.] MAY, 1894. [No. 372.

THE LATE MR. JOHN JENNER WEIR, F.L.S., F.Z.S., F.E.S., & F.R.H.S.

Many of our readers must have been pained by the brief announcement made in our last issue of the death of this gentleman, and will, we are sure, gladly receive some particulars of the interesting and well-filled life that, after so brief a warning, has come to a close. Mr. Jenner Weir was born at Lewes on the 9th of August, 1822. Like many who have done much valuable work in Natural History, it was only in his leisure hours that he could pursue the study, other avocations engrossing the principal part of his time. In 1839 he entered the Customs service, and passed on through various stages, until in 1874 he was made Accountant and Controller-General of H.M.'s Customs, London. The estimation in which he was held may be gathered from the comment made by the 'Civil Service Review' of August 22nd of that year, in announcing his appointments: "It is believed that this is one of those rare instances in which promotion gives universal satisfaction." In August, 1885, he retired from the Civil Service.

Mr. Jenner Weir's interest in Entomology did not begin at so early an age as it has often done with many others; at least he did not take it up as a study until the summer of 1843. His first public communication on the subject was to the 'Zoologist,' dated the 14th June, 1845, on the capture of *Ino* (*Procris*) *globulariæ*, *Agrotis cinerea*, and *Crambus pygmæus* (= *Platytes cerussellus*) at Lewes. Late in 1844 he attended a meeting of the Entomological Society for the first time; and in January, 1845, he was elected a Member, which he continued to be for the remainder of his life, a period of nearly fifty years, being at his death almost its oldest member. For many years Mr. Jenner Weir worked assiduously at the Micro-Lepidoptera; but in 1870 an accident, which resulted in the loss of the top of the left thumb, put an end to the setting of these insects.

The bent of his mind was always towards the solving questions of general biological interest, and especially such bore on the mutual relations of the many diverse forms of in which he was interested; and he was one of the earliest appreciate the advantages of the direct experimentation wh now engages the attention of a distinct school of entomologi besides entering largely into the work of many others. This shown in the first paper he ever read before the Entomolog Society, on March 1st, 1869, in which he described a serie experiments on the relation between insects and insectivo birds, undertaken during the year 1868, at the suggestion of A. R. Wallace. A further paper on the same subject was by him on July 4th, 1870. From 1849, Mr. Jenner Weir often a member of the Council of the Society, of which he for seven years Treasurer and twice a Vice-President.

He was elected a Fellow of the Linnean Society of Lon on March 2nd, 1865, and a Fellow of the Zoological Societ 1876, and was at the time of his death a member of the Fina Committee of that Society. In 1894 he became a Fellow of Royal Horticultural Society, and was at his death a membe its Scientific Committee and of its Narcissus Committee. Of Ray Society he was a member from 1866, and for twenty year more was on the Council of that Society, frequently taking chair at its meetings. For several years he was Presiden Vice-President of the South London Entomological Society, he delivered his last Presidential address there on January 25 1894. Of the West Kent Natural History Society he was member and its President.

Mr. Jenner Weir carried on an extensive correspondence w the late Mr. Darwin, and frequent reference is made to observations in the works of that great naturalist,—in b volumes of his 'Descent of Man,' and of the 'Animals a Plants under Domestication,' as well as in the 'Expressions the Emotions.' He had a large correspondence with many ot naturalists of eminence, both at home and abroad; and it wa great pleasure to him to welcome on his recent visit to Engla the distinguished American naturalist Mr. Scudder.

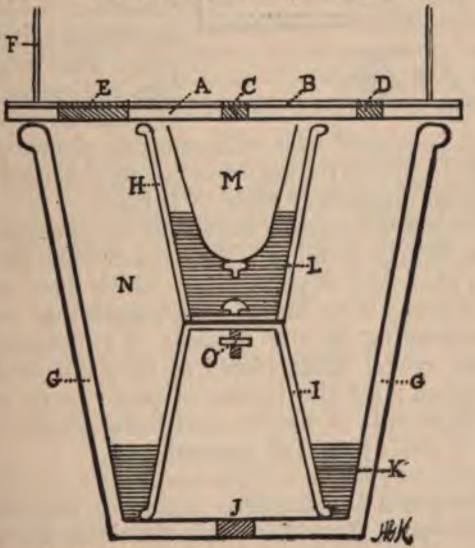
Mr. Weir was present at the meeting of the South Lond Entomological Society on March 8th, and took a considera part in the discussion there, besides exhibiting some specime It was on this occasion that he handed to the editor of t Journal the proof of his paper on "The Genera of Limnai Rhopalocera allied to *Caduga*," published in our last numb He appeared then to be in his usual health, and was much in rested in Mr. Frohawk's drawing of his new *Caduga*, with wh the paper is illustrated. It was known, however, to himself a his friends that his heart was affected, and the end came after very brief illness.

His life was a fine example of a useful, peaceful, and happy one. His important official duties yet left him sufficient time to indulge that love of nature of which he has himself said that it was all his life a passion with him; and after his retirement from the public service this passion, combined with a wide range of information on different subjects, including a most intelligent interest in many things outside the reach of his own studies, an equable temper, thorough enjoyment of home, not excepting its study, well stored with delightful books of reference, and its garden distinguished by many beautiful flowers and some pet birds,—all these rendered the last part of his life by no means the least happy part of it. To his friends he was a most agreeable companion, and the help and encouragement he was always ready to give to younger students of Natural History will ensure him for a long time to come a grateful place in the memory of those who participate in the tastes that had such a fascination for him, while by a much wider circle his loss will be deeply mourned.

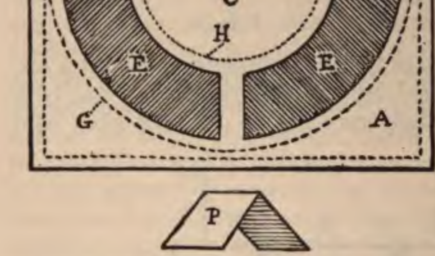
A DARK CHAMBER FOR LARVÆ.

By H. Guard Knaggs, M.D., F.L.S.

Now that the season for breeding Lepidoptera is coming on, some instructions, accompanied by cuts, showing how easily a dark chamber can be constructed, may not be out of place; and a few details as to the various uses to which the apparatus may be put have been added.



The first, sectional, figure explains how two small flower-pots, H and I, are secured base to base by means of a bolt and nut, O, and how they are fixed within a larger flower-pot, G, with Portland cement, K, the rims of H and G having been first ground or rasped level, that the slate A may lie upon them evenly. A bowl of a wine-glass, M, or other vessel for containing water, is then embedded into cement L, in the pot H, in such a manner that it is afterwards removable. The space N, between the pots H, I, and G, is for the reception of soil, or such other materials as occasion may require.



The slate A (also represented in the second figure by corresponding letters to prevent repetition) is covered with felt or canvas, B, and is perforated by drill and rhynder at D D, or sawn out as at E E. The dotted circles H and G indicate the position beneath of the flower-pots; whilst the dotted square, F, shows that of the breeding-cage above. For most purposes the holes D D, of about five-eighths of an inch in diameter, will be found best adapted; for the largest larvæ readily find their way down them to the chamber, which is darker, and better suited for a hiding-place than when the openings are larger, and, what is of greater importance, these openings can be roofed over with movable pieces of card or tin, bent as at P, to prevent frass from falling amongst the soil, &c., and causing an unsanitary state of things.

There are many purposes for which the space N may be used; for instance, it may be filled with eight or nine inches depth of sand for *A. ripæ* and other Agrotes which love to burrow; for butterfly and many other larvæ, sods or turfs may be substituted; or again, according to the inmates of the cage, bark, rotten wood, broken reeds, short pieces of bamboo, dead leaves, &c., may be supplied; for the habits of many larvæ are to secrete themselves in a state of nature, and these do not seem to thrive if deprived of their places of concealment.

For hybernating larvæ a little modification of the chamber is required: the pot G and contents should be sunk in the earth in a north-east aspect, the water-vessel should be discarded, and the centre hole plugged with the stalks of such evergreens as laurestinus, aucuba, ivy, euonymus, &c., with a few spikes of plantain-seeds, and perhaps a piece of potato and carrot on the slate. If a bell-glass be not substituted for the ordinary cage, an umbrella-like arrangement should protect the latter from rain and snow, while the interior, N, should be loosely filled with a selection from the materials already named.

For subterranean pupation this chamber is especially adapted, and for this purpose it should be stocked with a soil resembling that which the occupants of the cage inhabit in their native haunts, as peat, sand, loam, chalk, maiden earth, leaf mould, fir mould, as the case may be. Great care should of course be taken to eject and exclude vermin; the soil should reach to within about an inch of the slate, and be covered with a thin layer of cocoa-nut fibre, rubbed birch catkins, or prepared moss. Provided the soil is suitable, this chamber may be used several times over for batches of different species as they become ready for pupation. When we consider that a sufficient number have gone to earth, the slate with the larger openings, E E, may be exchanged for the one with perforations, D D, care being taken to stop all chinks and crevices, that no enemy may gain admittance to the interior; or, if preferred, the stage and cage may be discarded altogether for a cylinder of muslin, of close texture, made on a wire frame, and tied tightly under the rim of the pot G. There is no ingress for vermin below, and few, if any, can do harm through the book muslin, which affords a good foothold for the insects as they emerge, acts as a shade against too powerful sunshine, and is sufficiently transparent to permit of a view of the interior.

N.B.—If mice, or other creatures which might gnaw the muslin, are in evidence, it would be as well to place lightly on the soil a framework, to which the imagos on making their appearance could cling, and cover the whole with a suitable bell-glass, bedded in plaster on to the rim of the pot G, in order to exclude intruders.

Unless there is reason to fear that mischief is going on, it is never advisable to move the earth containing the pupæ; but if the soil should at any time appear too dry, sufficient moisture may be administered through the porous sides of the dark chamber.

Folkestone, April 7th, 1894.

ON A HABIT OF *EROS* (*PLATYCIS*) *MINUTUS*, F.

BY W. L. DISTANT.

IN the February number of this Magazine (p. 33) Mr. Shipp has recorded his discovery of a colony of *P. minutus* in Gloucestershire, and in describing the habits of the species truly remarks, "The insects themselves are of a very sluggish disposition, rarely moving more than a few inches during the heat of the day," &c. One hint may, however, be added to this item, and one that may prove useful to the collector, but to state this necessitates taking up the narrative of Mr. Rye's previous captures at Bristol, to which Mr. Shipp refers.

It was during the British Association meeting at Bristol in 1875, that a few entomologists, including the late H. W. Bates and E. C. Rye, in company with R. McLachlan, A. Hudd, Stephen Barton, and the writer, spent a pleasant day collecting in Leigh Woods. On the morrow we all met by appointment to dine with our friend Barton; but Rye was late, and we waited like hungry men. But when Rye appeared he produced, in exculpation, a small bottle containing a series of specimens of this very rare species which he had that morning discovered, and so graphically did he describe the position in the woods of the old rotten stump that had contained the find that I had no difficulty, on the following day, in going direct to the same. It was acting on Rye's instructions that I took the best part of my set, and am able to give what was really his hint, and that is to spread out handfuls of the old decayed wood in the sun, and smoke a contemplative pipe in the vicinity. In periods varying from a quarter to half an hour, I found that these bright-coloured little beetles were sure to be seen. The successful experiment of 1875 will probably be equally efficacious in 1894.

Pretoria, Transvaal, March 7th, 1894.

MR. W. BATESON ON VARIATION.*

THE author of this work appears to be amongst the number of those who think that the constant repetition of the words "Variation" and "Selection" by biologists—in a manner that reminds one somewhat of the Thibetan praying-machine—is not a sufficiently definite explanation of the "origin of species," and he apparently hopes to get some help from the introduction of the term "discontinuity." Whether we are in this way to get any assistance or not in our awkward efforts to understand that which is certainly at present very obscure, if not entirely incomprehensible, we shall not here consider; indeed, had the work consisted merely of speculative matter, we should not have brought it to the notice of the readers of the 'Entomologist,' even though the speculations were presented in a thoughtful and graceful form, as is here the case.

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* 'Materials for the study of Variation, treated with special regard to discontinuity in the Origin of Species.' 8vo, pp. xvi. & 598. Macmillan & Co., London. 1894.

The work has, however, much stronger claims on the attention of entomologists, for the author has brought together a very large number of instances of unusual structures and relations of structures, while insects receive quite a fair share of attention at his hands. As this latter feature is a departure from the usual custom of "biologists,"—who only too often in their considerations either entirely omit reference to the most extensive and zoologically important class of the animal kingdom, or treat it in a fashion that is perhaps even worse than total omission,—it is only proper that the work should receive from entomologists an appreciative welcome, as we are sure will be the case when it becomes known to them.

Under the term "Variation" Mr. Bateson includes a wider range of facts than the word is usually made to cover; a large part of his work, indeed, refers to "monstrosities," which are not generally treated as variations, though no doubt "sensu latiori" they are such. A large number of these cases are described by the author, who has had specimens entrusted to him by various entomologists, foreign as well as English. As to these particular sorts of variations he has been able to find some interesting results, and, as might be expected, to discover that order prevails even in this realm of apparent disorder. Symmetrical relations of a perfect kind are shown by close scrutiny to be present in cases where, on superficial examination, such a condition would be assuredly treated as wanting. Hence extra legs and antennæ form one of the most interesting sections of the work. The extra wings of Lepidoptera—of which a number of instances are described—have not, however, yet given any sign of being anything but quite disorderly productions.

Another interesting section to entomologists will be found under the heading "Ocellar markings, especially those of Lepidoptera." Here the remarks of the author—particularly if they be read in conjunction with Griffiths' and Urech's researches during the last year or two—will be found very suggestive.

There are very many forms of variation that are not touched on at all in the present work, and we may express a hope that the author will soon be able to treat these in another volume. Colour variations, size differences, and dimorphic and cyclical forms are not here considered. Using the word "variation" in a sense so wide as Mr. Bateson does, we think even secondary and tertiary sexual distinctions should be included. Probably a systematic review of the various morphological forms that may be found in a single physiological species would, if well done,—that is, if the species were well chosen,—be as interesting a study in variation as could be made. The difficulties in the way of carrying out such a review are, however, at present so great that much time would have to be given to the adequate performance of the task. Perhaps it was this consideration that induced Mr. Bateson to take "discontinuous" variation for his first study. We may hope that by giving us a second volume he will illustrate practically the value of continuity, and also help us to realise more clearly than we do at present in what way continuous differs from discontinuous variation.

The book is provided with excellent indexes, which add very considerably to its value.

D. S.

THE GENUS *PHILOMETRA*, GROTE.

BY JOHN B. SMITH.

IN the 'Entomologist' (*ante*, pp. 97–99) Mr. Butler makes some remarks under the above caption, involving a criticism of my 'Catalogue,' and of some statements made in it.

I have just completed a monographic revision of the American species of Deltoids, in which the characters of all the genera are fully worked out; hence I will not discuss them here at any great length, but will confine myself to such admissions and explanations as Mr. Butler's remarks seem to make necessary.

To make one portion of the criticism clear, I reproduce the citations especially referred to, just as they stand:—

P. GOASALIS, *Wlk.*

1859. Wlk., C. B. Mus., Het. xvi. 134, *Epizeuxis*.
1859. Wlk., C. B. Mus., Het. xix. 876, *Epizeuxis*.
metonalis, Wlk.
1859. Wlk., C. B. Mus., Het. xvi. 236, *Herminia*.
longilabris, Grt.
1872. Grt., Trans. Am. Ent. Soc. iv. 99, 309, *Philometra*.
1873. Grt., Bull. Buff. Soc. Nat. Sci., i. 40, *Philometra*.

This is the plan of the entire Catalogue, and it gives first, in full-faced type, the name of the species, centred. Next follow the references, each occupying a full line, beginning with the date and ending with the generic term used by the author cited. Next follow the synonyms, if any; a full line devoted to each name, which is flush and printed in italics. Under each synonym follows its bibliography, exactly as under the original species, and the last citation to each such name is that in which it is made a synonym. Where no such citation occurs it indicates that the reference is original in the Catalogue. I must confess this seems very clear to me, and I have not heretofore found anyone that failed to understand the plan of the Catalogue in the way Mr. Butler seems to have done. All my monographic works for the few years last past have been on the same plan as far as the bibliographical features are concerned, and none of these have ever been misunderstood, so far as I have learned. On the question of Mr. Butler's preference for some other method I can of course have nothing to offer.

Two of Mr. Butler's points are well taken:—It is *gaosalis* instead of *goasalis*; and the species is first described in vol. xix. p. 876, not in vol. xvi. p. 134. How I made the error I do not know, nor is it material; similar errors occur in many large catalogues. As a result *metonalis*, Wlk., takes priority, and the synonymy is as Mr. Butler gives it,—a mere substitution of one Walker name for another.

Concerning the generic terms used, I have concluded that *Chytolita* is not the same as *Herminia*, whichever species is used as type; but yet less does it correspond with *Zanclognatha*, as Mr. Butler seems to indicate.

The type of *Herminia* cannot, even yet, be considered finally fixed, for there is no agreement in the matter; but assuming that Dr. Moore was correct in fixing *barbalis* as typical, our American species of *Philometra* are not congeneric, if Lederer's description of antennæ and venation of the European form are accurate. The basis for my conclusions on this point will be found in the descriptions and drawings in my 'Revision of the American Deltoids.'

There remains one point only to be considered, and that is—"Under *goasalis* Walker has also a specimen of *Herminia petrealis*, Grt., which he did not recognize as distinct." I meant just what I said; and if *metonalis* had been intended, I would have used that name. Referring to my original notes I find that, in examining one box, I made the memorandum:—"*Epizeuxis gaosalis*, Wlk.? Type = *Chytolita petrealis*, Grt. Type"; indicating that I compared the specimen with the Grote material. Later in my note-book, seventeen other memoranda intervening, I come upon the note referring to another box:—"*Epizeuxis goasalis*, Type from Nova Scotia = *Phil. longilabris*. Another specimen is labelled in Walker's handwriting, and is *petrealis*, Grote. The type must govern."

Walker's description indicates only one specimen, that from Nova Scotia; but there is nothing to prevent other specimens being labelled by Walker after the description; and that Walker mentioned only one specimen in 1859, cannot be used as an argument against any statement of mine based on an examination made in 1891. I therefore wish the above extracts from my notes to stand as a reiteration of the paragraph quoted from my Catalogue, and I assert their correctness.

Mr. Butler's corrections in the really essential parts of his criticism are admitted, and need no apology, since truth and accuracy are the ends for which both he and I professedly labour.

The only matter upon which I am left in doubt, after carefully reading Mr. Butler's note, is, whether he could really have misinterpreted my citations in the (to me) absurd manner suggested by him.*

REMARKS ON CERTAIN GENERA OF *COCCIDÆ.*

By W. M. Maskell.

(Concluded from p. 95.)

Lecanium nigrum, Nietner, 1861; *Lecanium depressum*, Targioni, 1867-8; *Lecanium begoniæ*, Douglas, 1892,

The first of these three has been reported from India and Demerara; the second from hothouses in Europe and New Zealand and from open air in Australia and Sandwich Islands; the third from Demerara. They are thus evidently all from tropical, or at least hot, countries.

I have arrived at the conclusion that they are all practically identical, or at the most varieties of one species. Priority in nomenclature compels me to adopt *L. nigrum* as the type, although really no scientific description of that insect appeared before that of Mr. Douglas in 1891. Nietner (Enemies of Coffee-tree) gives no details; and Mr. Green (Ind. Museum Notes, 1889), though giving several figures, attaches thereto scarcely any description. On the other hand, Targioni (Stud. sulle Coccin. and Catal. 1868) is equally unsatisfactory as regards *L. depressum*, but Signoret (Ann. de la Soc. Ent. de France, 1873) gives sufficient details and really deserves to be credited with the species. *L. begoniæ* is only described by Douglas (Ent. Mo. Magazine, Aug., 1892).

I may observe that the remarks about to be made are founded on specimens received by me,—of *L. nigrum*, from Mr. Cotes (Indian Museum); of *L. depressum*, from Dr. Signoret; and of *L. begoniæ*, from Mr. Douglas; so that I can have little doubt as to identification. Strictly, these observations ought to have been made in my paper of 1892, when I reported *L. depressum* from Sydney and Honolulu, for I had then in my possession the same material; but having many other things to think of I overlooked the point.

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* In answer to the above, I would also reiterate my former statement:—The first reference given by Mr. Smith was not needed, and therefore put me out, as it evidently did him also; had the synonyms been arranged in the usual way, such an error could not have occurred. As already stated, only *one* specimen, labelled as *E. gaosalis*, ever existed in our collection: therefore I fail to comprehend how Mr. Smith could have made notes on *two* in different drawers. I have gone through the whole, and no second example, so labelled, is in any Museum drawer.—A. G. B.

The main reason for considering the three insects named as belonging to one species is the character of the epidermal cells; and I may quote here the expressions thereon of the authors mentioned. Previously, however, we may discard an external character referred to by Signoret,—"dorsum slightly elevated, with two small depressions in specimens from Italy and two carinæ in specimens from France,"—because evidently this is not a constant character. As regards the epidermis, Signoret says of *L. depressum*:—"Exhibiting a great number of tessellated irregular plates forming a marquetry pattern; each plate has a darkish band round it, with a clearer but still rather dark surface-space and a central clear space with a small orifice." And in his Plate 13, fig. 11 *a*, he delineates the cells as irregularly polygonal.

Douglas says of *L. nigrum*:—"Under the microscope the whole surface is seen to be covered with a tesselation of closely approximate small yellow dots and punctures"; but he does not specially mention their form.

Douglas says of *L. depressum*:—"Surface covered with a reticulation of irregular shallow cells with a pale centre or ocellus."

Douglas says of *L. begoniæ*:—"Covered with contiguous, minute, oval, yellowish dots."

Green, Targioni, and Nietner make no mention of the epidermal cells.

It seems clear here that Mr. Douglas agrees with Dr. Signoret as to the irregular form of the cells in *L. depressum*, but his language leads one to think that he considers those of *L. nigrum* and *L. begoniæ* to differ in being more dot-like and oval.

But, on further consideration, it is doubtful whether Mr. Douglas made any examination of the epidermis except an *external* one (that is, viewing the insect *in sitû*, without preparation). For although, examined in this manner, a certain (though by no means a great) difference seems to exist in the cell-forms, yet closer observation by transmitted light shows that in reality they are identical. The cells of *L. nigrum* and *L. begoniæ*, which at first sight appear more or less oval, are then seen to be very clearly polygonal and irregular, and to form what Mr. Douglas says of *L. depressum*, a "reticulation." In some specimens of *L. begoniæ* I find the cells perhaps rather smaller than usual; but as a rule, in all three insects, the average (longest) diameter of a cell is about the same, 1-500th of an inch. The outer band and the central orifice are visible in all. Perhaps the cells in *L. begoniæ* may be the darkest in colour.

Looking therefore at the epidermis, it appears sufficiently clear that the three insects are identical; while in size, colour, and generally convex form, they also agree. Mr. Douglas, indeed, says that some of his specimens of *L. depressum* were greenish yellow instead of brown; but the difference is not important. He also says that *L. nigrum* belongs to Signoret's 4th series, with *L. coffeæ* and *L. hibernaculorum;* but this is certainly due to his considering its cells as oval, whereas, being polygonal, the insect goes with *L. depressum* into the 5th series.

With regard to the antennæ, I do not find any difference between *L. nigrum* and *L. depressum;* the figures given by Signoret and Douglas agree, and so do my own specimens; both have eight joints, of which the third is the longest. In *L. begoniæ* there appear to be only seven joints; but Mr. Douglas specially remarks that in the fourth joint there is "a constriction simulating a joint"; and this "false joint" (as I have called it in other Lecanids) seems quite enough to raise doubts as to any definite separation of this insect from the others.

As regards the feet, Signoret says of *L. depressum* that the digitules of the claw are dilated and "one larger than the other." Douglas says nothing of the foot of *L. depressum;* as to *L. nigrum*, he says:—"Digitules long, broad, much dilated"; and of *L. begoniæ*, "digitules normal." I have not myself been able to detect any valid difference in the three, nor can I see the unequal digitules of *L. depressum*.

Taking therefore these important features,—the epidermis, the antenna, and the foot,—it seems fairly clear that there is no real difference between the three insects named, at least as far as concerns the adult female. The females of the second stage appear to be equally similar. I have not observed the larvæ or the males, nor, I think, has anybody except Mr. Green, who gives figures (without description) of the adult male of *L. nigrum* and its waxy pupal test. Possibly *L. begoniæ* might be looked on as a variety on account of its antenna, and *L. depressum* on account of unequal digitules; but these are doubtful differences, and the three must be taken as really one species. Priority of nomenclature, as above mentioned, determines this as *L. nigrum*, Nietner.

Wellington, New Zealand, Oct. 12, 1893.

THE CONFUSION IN THE NAMES APPLIED BY WALKER TO GENERA OF MOTHS.

By A. G. Butler, Ph.D.

It would appear that the late Francis Walker must have kept a list of names by him to use for his new genera, and that he did not by any means invariably remember to cross off a name after he had used it. This has been a source of endless trouble to his successors; and inasmuch as the corrections which he subsequently published were not, at the same time, made in the cabinet-drawers, considerable confusion was naturally caused subsequently.

As an instance of this kind of blundering I may cite the following:—In Lepidoptera-Heterocera (Part xvi. p. 7) Walker described a species of his genus *Episparis* as the type of a new genus which he called *Neviasca*, the type being *N. varialis*, from India.

At page 199 of the same volume of the Catalogue, a Bornean species (belonging to a section of the genus *Bertula*, from which it differs in the strongly pectinated antennæ of the male) was made the type of a new genus, to which the name *Neviasca* was again given.

When making up his Index, in vol. xix., Walker discovered this mistake; therefore, at p. 888 of that volume, he altered the name of the second genus *Neviasca* to *Cardalena*. Here one would have supposed that the confusion might have ended.

In vol. xxxiv., forgetting that he had already given a new name to his second genus *Neviasca*, Walker proposed, at p. 1174, to call the latter *Gabrisa*.

At p. 1266 of the same volume he described an Australian insect as the type of a new genus, to which he also gave the name *Gabrisa*.

Finally, in vol. xxxv., he proposed to alter the name of his second genus *Gabrisa* to *Voliba* (*vide* p. 1983).

And, in addition to all this confusion, one of the references given in the Index to vol. xxxv. is incorrect. Can it be wondered at that when we in England, with all the material before us, find it difficult to unravel Walker's tangles, many foreigners have been driven to throw up the almost impossible task in despair.

The case which I have cited is by no means unique, and each one needs to be followed up step by step, and the facts accurately recorded, before all difficulties can be smoothed away.

SIX YEARS' ENTOMOLOGY IN CO. GALWAY.

By the Hon. R. E. Dillon.

(Continued from p. 91.)

Acronycta ligustri. Fairly common. Comes to light, but chiefly taken flying round privet and lime at dusk.

Acronycta myricæ var. *montivaga.* Two specimens taken *in cop.* within fifty yards of the house, July, 1889.

Diloba cæruleocephala. Comes freely to light when the moth-trap is placed high. I only took seven specimens this spring in the trap, on the top of an old castle about seventy feet from the ground.

Leucania extranea. In July, 1891, I took one specimen at sugar on an ash tree. It was immediately identified by myself, and by Mr. Kane afterwards.—*L. impudens.* Several specimens taken at light; three flying, July 30th, 1892.

Gortyna ochracea. One specimen flying, June, 1891.

Xylophasia sublustris. Fairly common at sugar.

Dipterygia scabriuscula. One specimen in 1891; month uncertain, as it is mentioned in a list extending over two months and a half during my absence. It was taken by my gamekeeper.

Cloantha polyodon. One specimen taken at sugar, July, 1891, on the same ash tree as *L. extranea.* I did not identify it, but Mr. Kane recognised it immediately, from the sketch I had made of it in my diary.

Luperina cespitis. Several specimens; two this year (1893).

Apamea ophiogramma. One specimen taken here by Mr. W. F. de V. Kane, 1893, at sugar along a river.—*A. leucostigma.* Not uncommon at sugar.

Miana bicoloria. Not uncommon, but only a few seen at a time.

Agrotis saucia. One specimen taken at sugar, August, 1893, by Mr. Kane.—*A. nigricans.* One specimen at sugar, August 2nd, 1892. —*A. corticea.* Two specimens at sugar, August 2nd, 1892.—*A. agathina.* One specimen, 1892.—*A. strigula.* Two specimens; one in moth-trap; the second flying over heather, June, 1893.—*A. præcox.* Two specimens at sugar, July 29th, 1892.

Noctua dahlii. I have only taken one specimen, at dusk, on scabious, August, 1893. Mr. Kane, I believe, secured one also near the same place, the same evening.—*N. sobrina.* Two specimens taken here; one at sugar, and the other flying near sugar, August, 1892.—*N. castanea.* Two examples, September, 1893.

Triphæna subsequa, Hb. One specimen, August, 1893, at sugar.

Amphipyra pyramidea. Very common; a nuisance at sugar.

Panolis piniperda. Not uncommon. Mr. Kane and I secured about five and twenty specimens, at sallow, in the spring of 1893.

Pachnobia rubricosa. Not uncommon.—*P. hyperborea.* An imago emerged in a breeding-cage in a warm room, March 29th, 1892. The note in my diary reads: "A moth emerged this morning; looks like *P. alpina*, but seems impossible." The larva was picked up on a bog while shooting. The insect was sent to Mr. Kane, who immediately identified it. On his first visit I took him to the bog in question, where "*Empetrum nigrum*" grows very freely throughout. I searched a good deal this summer, but the food-plant did not—even on the hottest days—show signs of larvæ feeding.

Tæniocampa opima. Not uncommon. Mr. Kane and I secured over twenty specimens, at sallow, in the spring of 1893; several subsequently were taken in moth-trap. — *T. populeti.* Two specimens; (1) April 13th, 1893, on a stalk of dead ragwort, in the afternoon; (2) April 19th, 1893, in the moth-trap.—*T. gracilis.* Not uncommon; several were taken in the moth-trap.—*T. munda.* Four specimens at sallow, March 19th, 1894.—*T. pulverulenta.* Not uncommon, but local.

Orthosia lota. Fairly common.

Anchocelis rufina. One specimen, September, 1893.—*A. lunosa.*

Two specimens were on ivy near the town of Galway.—*A. litura.* Three specimens near Galway at ivy; one at rest on a blackthorn tree.

Oporina croceago. One larva was picked up on a road under an oak tree, 1889. I have no record as to the date of its emergence, as I confounded it with *Xanthia citrago,* owing to the poor description in my book.

Xanthia citrago. Two specimens, one at sugar and one flying, 1889. —*X. aurago,* One specimen, August, 1892, at sugar, identified by Mr. Kane from a sketch in my diary.

Cirrhœdia xerampelina. Two specimens: (1) August, 1892; (2) August, 1893; taken by Mr. Kane.

Calymnia trapezina. Common.—*C. affinis.* One specimen, 1890.

Dianthœcia capsincola. One specimen.—*D. cucubali.* Three specimens: two taken in moth-trap, May 11th, 1893; one by the gamekeeper in my absence, in June, 1893.

Hecatera chrysozona. Fairly common. I have only once taken an imago, but have had many larvæ, though they were found difficult to rear.—*H. serena.* Two specimens, *in cop.*, August 14th, 1891.

Polia chi. One specimen.

Dasypolia templi. One specimen flying, October, 1890, near the Deer park (oak wood and swampy ground).

Epunda lichenea. Two specimens flying in a blackthorn scrub, in the afternoon, September, 1893, near Galway.

Cleoceris viminalis. Two specimens, taken by the gamekeeper in 1891 and 1892; date uncertain; they were not identified till the spring of 1893, when they, with others, were sent to Mr. Kane.

Hadena protea. One specimen, taken at the end of July, 1893, by the gamekeeper, was identified by me on my return. Mr. Kane examined the insect in August.—*H. glauca.* One specimen, moth-trap, May 23rd, 1893.—*H. contigua.* Four specimens: three boxed on trunks of small birch trees; one flying, September, 1893, near the town of Galway.—*H. rectilinea.* Several specimens, near Galway town, on trunks of trees and palings. A single specimen was caught here in the moth-trap, September, 1893.

Calocampa solidaginis. One specimen, flying near ivy, not far from Galway, September, 1893.

Xylina semibrunnea. One specimen, at ivy, September 3rd, 1893, near Galway town.—*X. socia.* Not uncommon.

Asteroscopus sphinx. Not rare. Nine male specimens during the spring, 1893, in the moth-trap. Another male was taken flying round a lime tree, August, 1890.

Cucullia verbasci. Several specimens taken during different years; never common.

Plusia bractea. I never saw this insect until 1893. I took eleven specimens in July and August.

Bankia argentula. One specimen while grouse shooting, August 28th, 1893.

(To be continued.)

NOTES AND OBSERVATIONS.

The Melanism Controversy. — Mr. Kane and others appear to attribute melanism to two entirely different causes. Firstly, that in countries with defect of sunshine (such as the British Isles) dark coloration would be advantageous, and consequently is fostered by natural selection; secondly, to adaptive coloration. What I want now to ask is, where do they draw the line between the two? To illustrate my question I will bring forward two places on the sea-coast (distant about thirty miles from each other), Portland and Bournemouth. The former is one mass of stone; the latter is heath-land, the soil of the greater part of which is black and wet; but Bournemouth has a considerably warmer climate, a greater amount of sunshine, less fog, and a much smaller rainfall than Portland; yet there is a considerable amount of difference in coloration between certain species of insects found in the two places, those from Portland being invariably the lightest. For instance, *Satyrus semele:* the ground colour of the under side is light at Portland, dark at Bournemouth and also at Glanvilles Wootton. *Lycæna ægon:* some females I have from Portland are of a lighter brown than usual, and are without the orange bands, reminding one of the var. *allous* of *L. medon.* *Gnophos obscurata* is of a light grey shade at Portland, still lighter on the chalk soil at Lulworth; of a darker grey shade at Bournemouth, still darker on Parley Heath. *Acidalia promutata* is much lighter at Portland than at Bournemouth. The following species are much lighter than is usual in Portland, but they do not all occur at Bournemouth:—*Epunda lichenea*, *Aporophyla australis*, *Heliophobus hispidus*, *Agrotis valligera*, *Scoparia mercurella*, *Larentia olivata*, and *Sericoris cespitana.* *Fidonia atomaria* and *Scodiona belgiaria* are slightly darker on Parley Heath, about five miles inland, than they are at Bournemouth on the coast. Many species of Lepidoptera are darker on the Surrey heaths than they are on the Sussex chalk downs, yet I believe there is no appreciable difference in the rainfall or the annual amount of sunshine. In reference to pale varieties occurring on chalk soils, it may be as well to mention that I once saw a white variety of *Lycæna alsus* which had been taken by a boy at Winchester; and that I possess a pale buff-coloured variety of *Argynnis aglaia* with the black spots and markings very faint, taken at Dover by Mr. Leplastrier. The Rev. W. T. Bree, in recording it in the 'Magazine of Natural History' for 1832, writes: "The specimen reminds one of some plant which, having grown in the dark, has, in consequence, produced its flowers nearly colourless." The yellow varieties of *Zygæna*, I think, may be cited as another instance of occasional pale varieties occurring on chalk soils. Perhaps some of the pale varieties are owing to their emergence during brilliant moonlight. In reference to the latter part of Mr. Kane's paper (Entom. xxvi. pp. 307–311), leaves frozen on to the ice will also absorb the sun's rays, the ice melting beneath and around them. — C. W. Dale; Manor House, Glanvilles Wootton, Jan. 3rd, 1894.

Notes on Melanism. — The following instances of melanism, or tendency thereto, have come under my notice at various times during the last fourteen years. The districts in which they have occurred were chiefly in Somersetshire and South Wales. In Somersetshire the locality was near the Bristol Channel, the valleys and low-lying land being wet in character, often flooded in a rainy season, the hills above being of the carboniferous limestone formation. In S. Wales the district was near the sea-coast, a great deal of marshy land being near, the valleys often wet, the hills above being of the old red sandstone. The following were the species noticed:—*Epinephele ianira.* Males not unfrequently very dark and velvety-looking near the sea. S. Wales.—*Pieris napi.* Females in some valleys occasionally broader-veined and darker-looking than typical specimens. S. Wales.—*Fidonia atomaria.* One specimen nearly black, amongst heather, on high ground near the Mendips. Somerset.—*Tephrosia crepuscularia.* Brown specimens, frequently. Somerset.—*Boarmia repandata.* The dark-banded form very frequent in S. Wales, and not unfrequently in Somersetshire.—*B. gemmaria* (*rhomboidaria*). A very dark specimen. Somerset.—*Abraxas grossulariata.* A dark specimen on the Cotswolds, Gloucestershire; a dry situation.—*Hybernia marginaria* (*progemmaria*). Specimens approaching "*fuscata*" more or less not unfrequent. Somerset, the darkest specimens taken on hills above Bath—a dry situation. —*H. defoliaria.* Specimens freckled over with dark spots, occasionally (Newman's 2nd figure). Somerset.—*Camptogramma bilineata.* One specimen with dark shade extending from middle of fore wings to the hind margin, and generally darker than typical specimens. S. Wales.—*Thera obeliscata.* One specimen with upper wings dark slate-colour, under wings dusky. Somerset.—*Hypsipetes sordidata* (*elutata*). Not unfrequently much darker and more suffused than typical specimens; one with upper wings entirely dark brown, no markings. S. Wales. —*Cidaria russata* (*truncata*). Upper wings *frequently* dark smoky brown and suffused (*perfuscata ?*). I did not see a single typical specimen (*centumnotata*, Newman) last summer. S. Wales.—*Phigalia pedaria* (*pilosaria*). One specimen with upper wings nearly black. Somerset. —*Xylophasia polyodon.* Specimens with upper wings black-brown, every season. S. Wales.—*Miana strigilis.* Dark brown specimens frequent in S. Wales, and occasionally in Somersetshire; "*latruncula*" appears the most common form in S. Wales.—*Miselia oxyacanthæ.* Dark brown specimens, as figured in Newman, several seasons. Somerset.—*Diurnea fagella.* Grey specimens not unfrequent. Somersetshire. — T. B. Jefferys; Langharne, Carmarthenshire, Feb., 1894.

Curious Find in an "Atlas" Cocoon.—Having recently purchased some cocoons of the Indian silk-moth *Attacus atlas*, I was surprised at the extraordinary weight of one of them, which, although a very fine one, seemed heavier than it should be. I therefore opened the cocoon, and was surprised to find inside it a piece of quartz, about three-quarters of an inch long by half an inch in width and thickness. The pupa was a pulverised, unrecognisable mass, evidently from violent contact with the piece of quartz whilst in the soft and tender stage following change from larva to pupa. The question is, how came the piece of quartz into the cocoon? The latter had evidently been spun upon a tree, because it is enclosed within a leaf, and has the pedicle woven around a stem attached to the leaf. I have never met with a similar occurrence before; nor has Mr. John Watson, of Manchester, an entomologist of long experience, to whom I mentioned the fact. Mr. Watson's idea is, that the portion of the tree on which the cocoon was spun probably rested against a rock, and the piece of rock being loose got pulled off by a sudden jerk of the tree. The, to my mind, most inexplicable part of the matter is, the fact that the piece of quartz is quite free within the cocoon, not a single thread being attached to it.—T. J. W. Finch; Swindon, March 27th, 1894.

Lycæna argiolus.—Referring to Mr. Chope's notes upon this butterfly (*ante*, p. 135), I can give some feasible explanation of the coincidence he has observed. The first question to answer is, what is the cause of an unusual profusion of the berries themselves, in this case those of *Ilex aquifolium?* There is certainly very little, if any, reliance to be placed upon the popular country saying, "That a large crop of berries in the autumn, predicts the severity of the following winter." On the face of it, it is evident that the only weather which can have any effect must be the preceding, and not the following. If the weather in April and May is gentle, warm, and bright, the flowers of the holly will have a good chance of being fertilized by insects; so that, other conditions being favourable, a large crop of fruit in the autumn will be the result. If, however, the weather during that time is cold and boisterous, an exactly opposite effect may be naturally expected. The weather which is favourable to the tree will also be favourable to *argiolus*, and *vice versâ*, for he is a most sun-loving little fellow; and unless he can get his proper share of sunlight, without much rain and wind, he prefers to remain snugly at home, beneath a protecting holly-leaf, leaving only the "wilder spirits" to do all the dancing and courting. A boisterous wind may perhaps destroy some of the already-laid ova, but I do not think this is often the case; for the butterfly always takes care to deposit its eggs upon the under side of the calyx, obviously for the purpose of preventing them from being blown away, together with the loosely-attached petals. Last year, in Sutton Park here, *argiolus* was exceedingly abundant, at the same there was plenty of holly-blossom upon the trees; but owing to a severe storm of wind and rain, which sprang up and lasted through the greater part of April 29th and 30th, large masses of bloom were destroyed, causing in most situations a scarcity of fruit in the succeeding winter. Although the crop of berries has upon the whole been small, I do not think it will necessarily affect *argiolus* this year, for the gale already mentioned was of too short a duration to prevent the laying of the eggs, and they when once laid are, I believe, tolerably safe. I have endeavoured to point out only one cause; there may be many others; so that the case may really be much more complex than it at first appears.—A. J. Johnson; Boldmere, March 29th, 1894.

Mesapia peloria, *Hewitson*.—With respect to the ambiguity in my description of the neuration of this species, alluded to by Mr. Edwards (*ante*, p. 128), it is, I think, only necessary to say that I reckon the origin of the third subcostal nervule from the point where the upper radial rises, and not at the point of separation of the third and fourth subcostals, which I have said is "about half-way between the end of the cell and the apex," or in one specimen, more, for the neuration varies a little in different specimens. However, the butterflies allied to *Aporia* may ultimately be grouped. I am inclined to think that *A. cratægi* will stand alone in its genus, the margins being almost entirely destitute of fringes; whereas, *soracta*, Moore, &c., are very strongly fringed. Is not this a character which should be regarded as of generic value?—W. F. Kirby; April 2nd, 1894.

Notes on Sawflies.—During the past two years I have turned my attention to breeding and rearing sawflies, and have found it a most interesting study, requiring little apparatus, and that chiefly of the rough-and-ready kind. The principal dangers are (1) death of the egg through the withering of the plant in which it has been laid; (2) death of the larva in the cocoon through mould, or simply shrivelling up just before the pupa stage. The best remedy for the first evil is to provide healthy growing plants for the parent to deposit the eggs in, but where this is not convenient, I have found that even should the leaf wither, the eggs may often be preserved by placing them on blotting-paper in a soup-plate full of water. I have hatched many larvæ in this way, and on the whole they have not proved more delicate than others. The eggs of *Nematus pavidus*, however, are an exception; for some (to me) mysterious reason they invariably perish if water is allowed to touch them. I have succeeded in inducing several flies to deposit virgin eggs, the result being as follows:—Male flies only from *Abia sericea*, *Cræsus latipes*, *C. septentrionalis*, *Nematus betulæ*, *N. ribesii*; larvæ from *Eriocampa annulipes* and *Hylotoma gracilicornis*; eggs from *Cladius viminalis*, *Dineura viridiorsata*, *Nematus lacteus*, *N. pavidus*, *Strongylogaster cingulatus*. In every case the parent fly was kept separate from all others from the moment she left the cocoon till after the eggs were laid. *Abia sericea*, *Cræsus latipes*, *C. septentrionalis*, and *Nematus betulæ*, laid very freely, and the larvæ hatched well and were nearly all reared. *Eriocampa annulipes* laid well, but when the larvæ were full-fed all but two died off without any apparent cause. The two survivors have not yet hatched. It almost seems as though *Hylotoma gracilicornis* has only partially acquired the power of parthenogenesis. Though the dozen females I had bred all deposited eggs, only two showed any signs of growth; both these hatched, but the larvæ were small and sickly, and perished in the cocoon. I may mention that I have noticed two forms of these larvæ; one (the commoner in this neighbourhood) being a beautiful bright mulberry colour, the other a yellowish green. Both have the usual yellow markings and black tubercles. The red is not very bright till the larva is about three-quarters grown, and becomes intensified shortly before spinning up. Both forms may be found feeding side by side, and are equally easily reared. I have not yet been able to discover whether the offspring of a "red" fly will also be red. The female of *Macrophya punctum album* will live a long time in captivity. Last year I caught a specimen which lived about three weeks, and deposited several eggs. She fed on ash leaves, making small irregular holes all over their surfaces. All round the holes the leaves appeared much bruised, and soon turned black. I should be glad to know whether this fact is well known, as I can find no reference to it in any of my books on entomology.—(Miss) E. F. Chawner; Lyndhurst, Hants, April, 1894.

The true distinction between Papilio epiphron, *Kn.*, and Papilio cassiope, *Fb.*—At the meeting of the South London Entomological Society, on March 8th, the statement, which has been often made, was repeated, that the distinction between these two forms consists in the possession of white pupils by the ocelli in the type (*epiphron*). Having the original descriptions, both of Knoch and Fabricius before me, I am inclined to think that this is not the true mark of distinction. Knoch, in his diagnosis, says, "utrobique ocellis seu maculis nigris"; and in his description adds, "Instead of the ocelli some specimens have, on one or both sides, only black spots or points." I am disposed to believe that the true mark of distinction is to be found in the condition of the orange band on the hind wings. In the type this, as shown in Knoch's figure, is a band; whilst Fabricius, in his description of *cassiope*, says, "in posticis in primis maculari rufa et in hac puncta tria nigra," and of the under side of the same wings he says, "absque fascia rufa." This suggests to me that *cassiope*, Fb., is the form in which the marking on the upper surface of the hind wings consists of three orange rings quite distinct from each other, with a black spot in the centre.—F. J. Buckell; Canonbury, April 6th, 1894.

Lepidoptera frequenting Flowers of Caltha palustris.—Mr. G. W. Oldfield (*ante*, p. 134) suggests it as probable that as no Lepidoptera are included by Professor Hermann Müller in the list that he gives, in his work 'The Fertilization of Flowers,' of the insects that visit *Caltha palustris*, this plant (as well as *C. segetum*) is unsuitable for fertilization by Lepidoptera. Without wishing now to enter into the question of how large or how small a part it plays in the work of fertilization, I should like to mention that the brilliant and common little moth, *Micropteryx calthella*, regularly frequents in large numbers the flowers of *Caltha palustris*, wherever this plant occurs in its haunt. This fact was recorded many years ago by the late Mr. H. T. Stainton in the T. B. Lep. Tin., p. 43 (1854), and again in the 'Manual,' ii. p. 301 (1859).—E. R. Bankes; The Rectory, Corfe C stle, April 9th, 1894.

Clostera anachoreta.—I wrote to you last November (Entom. xxvi. 361) respecting the finding of ova of *Clostera anachoreta*. As you appeared to think that I might have been mistaken in the species, I am writing again to say that six of the perfect insects emerged between the 6th and 8th of this month, and are finer and more beautifully marked and coloured than any I have previously seen. I have been fortunate in obtaining a considerable number of ova. Some years ago I bred *C. anachoreta* from bought ova, but the imagines were not to be compared with these I have now. I imagine the early appearance of the insects is due to their having been kept indoors.—(Miss) A. D. Edwards; 56, Marina, St. Leonards-on-Sea, April 9, 1894.

Description of the Larva of Callimorpha hera.—Referring to the clusters of warts on the back of the larva (*ante*, p. 122), Mr. Studd adds:—"Each of the clusters consists of seven warts; a central roundish one from which radiate two oval ones on each side, and one towards the head and another towards the anal segment. The two latter are of a lemon colour, the one towards the head being narrower than the other. The remaining five are a rich fulvous brown."

Colias helice in Cornwall.—Having seen that your correspondent, Mr. B. Stafford Chope, writes (*ante*, p. 135) that he has never heard of *Colias edusa* var. *helice* being taken further west than Sidmouth, I thought it might be a matter of interest to state that near Falmouth my cousins and I, in August, 1892, took six of these insects in less than a week, three being taken in one morning; and we also saw several others that, owing to the nature of the ground, we could not catch. Of these six, all of which are now in my possession, only one is the white form; the other five are a creamy yellow colour. *C. edusa* simply swarmed in several fields near where we were staying, but we did not see a single *C. hyale*.—E. H. Trenerry; 3, North Road, Clapham Park.

Smerinthus tiliæ two winters in Pupa.—I should like to record the emergence, on the 8th of this month (April, 1894), of a female *Smerinthus tiliæ*, which has been in the pupa state since July, 1892. It was one of a brood which I reared from the egg in that year, and all of which pupated in the course of July. They all (as I thought) duly emerged in April and May, 1893; but on turning out shortly afterwards the earth in which they had been I discovered this one, and as it seemed lively I put it in a box by itself, where it has been ever since until its present emergence. Is this at all an unusual occurrence? There is no possibility of any mistake about the matter, as I have done no digging since 1892, nor have I had any larvæ or pupæ of this species in my possession, and this particular specimen has been kept in the same box in which it emerged, with no other pupa larger than *Notodonta dictæa* to keep it company. I may add that I had not the smallest expectation of rearing it, as I never attempted to damp it in any way, and it has been kept in a dry room all the time.—(Rev.) W. Claxton; Hartley Wintney, Winchfield.

Chesias rufata two winters in Pupa.—In September, 1892, I took about thirty larvæ of *Chesias rufata*. These produced only about half-a-dozen moths in the following May and June, and one on July 1st, a late date. As sixteen of the remaining pupæ appeared healthy, I did not throw them away, but was, nevertheless, surprised to find that an imago had emerged on March 26th last, an early date. Since then two more moths have emerged, proving that this species can pass two winters in the pupal stage, a fact I have not seen stated before.—A. Sich; Villa Amalinda, Burlington Lane, Chiswick, April 6th, 1894.

The Cyanide Bottle.—As bearing on Mr. J. Arkle's remarks on this subject (*ante*, p. 58), the description of a cyanide bottle from Paris may be of interest. Instead of having the cyanide of potassium at the *bottom* of the bottle, this has it at the *top*. The cork, bung, or stopper has a piece scooped out of the top about the size of a florin, and a hole of the circumference of a threepenny-piece is made through this, into which is inserted a little kind of bottle or phial (*ampoule*), with a flat circular-shaped body and a long neck, filled with a few lumps of cyanide, without the addition of any plaster of Paris. I find it advisable to cover over the mouth of the phial with a bit of fine muslin, however, to prevent the cyanide of potassium, when getting sloppy, from running down the sides of the jar. The only thing now is to get a suitable wide-mouthed bottle for the bung. My cyanide jar, which is fitted up as above, was obtained from a dealer in Paris. I have had it in use for some years, and it has performed its work satisfactorily throughout.—F. Bromilow; Nice, France, April 3rd, 1894.

New Edition of Hübner's 'Exotic Lepidoptera.'—The first part of this work has reached me, containing the first ten plates of the "Sammlung exotischer Schmetterlinge." I have promised to add a systematic index, and may perhaps add notes on some of the species, but do not propose to interfere with the existing letterpress, which will, I hope, be reproduced as it stands; nor do I assume any responsibility for the work, apart from my own additions.—W. F. Kirby; April 2nd, 1894.

CAPTURES AND FIELD REPORTS.

Vanessa antiopa in Essex.—I have no doubt that most entomologists will be interested to know that I took a hybernated specimen of *Vanessa antiopa*, in Epping Forest, on the 7th inst., at 4 o'clock in the afternoon. I found a specimen of *Amphidasys strataria* on February 25th. — W. F. Whittingham; North View, Walthamstow, Essex, April 11th, 1894.

Heterocera from Caussols, Alpes-Maritimes.—During a stay at Caussols, Alpes-Maritimes, last year (from Aug. 4th to Oct. 7th), I took a good many Heterocera, chiefly at indoor light. The following is a complete list, the aucuracy of the names being, in most cases, vouched for by Dr. Hofmann, of Ratisbon, Germany, who kindly determined them. The following is a list of the species:—*Ino ampelophaga* (2), near rushes on damp ground; *Zygæna sarpedon* (1); *Z. fausta*, abundant; *Setina irrorella* v. *flavicans*, one freshly emerged from the pupa, at rest on a rock; *Lithosia unita* (1), *L. caniola* (2), *L. lurideola ?* (2), *Emydia cribrum* v. *bifasciata* (1), *E. cribrum* v. *candida* (5); *Arctia fasciata*, a few small larvæ near the roots of trees; *Hepialus sylvanus* (2), found at rest; *Bombyx cratægi* (4), *B. trifolii* (2), the larvæ were common on a *Genista*—probably *G. cinerea; Agrotis ianthina* (2), worn; *A. pronuba* (1), torn, on a tree; *A. elegans* (12), *A. xanthographa* (2), *A. flammatra* (1), *A. constanti* (1), *A. decora* (1), *A. tritici* (10); I took a specimen of this last, at sugar, on Sept. 4th; *A. aquilina* (1), *A. crassa* (4), *A. clavis* = *segetum* (1); *Neuronia popularis* (9); *Mamestra brassicæ* (1); *Episema glaucina* (11), *E. glaucina* v. *trimacula* = *dentimacula* (1), *E. glaucina* v. *unicolor* (3); *Aporophyla lutulenta* (7); *Polia venusta* (3), *P. canescens* (9), *P. chi* (1), *P. xanthomista* (5); *Apamea testacea* (15), *A. dumerili* (11), one was small and dark; *Luperina matura* = *texta* (5) two being taken, at sugar, on Sept. 4th; *L. virens* (1); *Hadena ochroleuca* (9); *Leucania conigera* (1), *L. albipuncta* (11); *Caradrina hospes*, a rarity (1); *Anchocelis lunosa* (2); *Orthosia litura*, one bred, on Sept 26th, from a pupa found at the foot of a poplar six days previously. I now come to two very interesting specimens, which Dr. Hofmann considers to be referable to the genus *Orthosia*, being "either a very peculiar variety of one of its species, or perhaps an entirely new one;" but Dr. Staudinger "thinks it to be a peculiar aberration of *Tæniocampa munda*." One of these specimens was taken on the trunk of an elm, on Oct. 5th; it is of a yellowish grey colour, and the tip of the left fore wing is missing; the othe [illegible] d preservation, expands 1¾ in., and is somewhat more reddish.

It was also found on an elm, Sept. 19th.* *Cerastis* (= *Orrhodia*) *rubiginea*, one bred on Sept. 28th, from a chrysalis found the day before, under a stone; *Plusia gamma*, common; *Hypena obesalis* (1); *Acidalia contiguata* (1); *Boarmia occitanaria* (2), *B. consortaria*, a variety (6); *Gnophos obscuraria*, a somewhat light variety (4); *Phasiane scutularia* (7); *Enconista agaritharia* (3); *Ortholitha cervinata* (1), *O. mœniata* (1); *Lygris prunata* (2), flying among rocks, and plunging into the shrubs and herbage; *Cidaria galiata* (3), *C. frustata* (3).—F. Bromilow; Nice, Alpes-Maritimes, France, Feb. 16th, 1894.

Lepidoptera observed in Easter Week, 1894.—On Easter Monday last, whilst walking from Northwood to Rickmansworth, through Moor Park, we saw two hybernated specimens of *Vanessa polychloros*, also hybernated specimens of *V. urticæ*, *V. io*, and *Gonopteryx rhamni*. On palings we found *Anticlea badiata* and *Hybernia progemmaria*. The place where we saw *V. polychloros* must have been just on the borders of Middlesex and Herts, in which county actually I do not know. Is this species included in the list of Middlesex Rhopalocera? On the following day, at Weybridge (St. George's Hill), we captured a fine series of *Brephos parthenias*, two very worn examples of *Trachea piniperda* on pine trunks, one *V. polychloros*, and some very worn specimens of *H. progemmaria*. This morning one *Asphalia ridens* was bred from larvæ taken at Berkhampstead last season.—George E. Bergman; 29, Priory Road, Kilburn, N.W., April 8th, 1894. [Mr. Cockerell included *V. polychloros* in his "Preliminary List of the Insect-Fauna of Middlesex" (*vide* Entom. xxiv. p. 31).—Ed.]

Remarks on the Early Season and on "Assembling."—I think the present season is earlier than last. I saw *Pieris rapæ* here on March 25th, several *Pararge egeria* in Dorsetshire on March 31st, and *Ligdia adustata* (2) here this evening. I have been trying "assembling" lately with *Brephos parthenias* and *Amphidasys strataria* (*prodromaria*). With the first-named I had no success, but of the latter I took about fifteen males on March 21st, and six on another evening shortly after that date; on each occasion the time was between 9 and 10 p.m., and the specimens captured were in good condition.—W. M. Christy; Watergate, Emsworth, Hants, April 5th, 1894.

Nyssia hispidaria in Gloucestershire.—Not being able to find any note of the occurrence of *N. hispidaria* in this county, let me record the capture of twenty males and five females in the Forest of Dean, between Feb. 3rd and March 11th, all at rest on oak trunks. Assembling proved a failure, but the females all paired with captured males, and all deposited ova. This moth seems to emerge rather late in the afternoon; eight out of the twenty were drying their wings when found; time, between 4 and 5 p.m. Last year I diligently searched the trees in the same locality several times, but, probably owing to my visits having been made too early in the day, took one specimen only.—N. F. Searancke; Mitcheldean, Gloucester.

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* [We are indebted to Mr. Bromilow for sending us these interesting specimens for examination, and believe that we may congratulate him on the discovery of a new species nearly allied to *Tæniocampa munda*.—Ed.]

Early Appearance of Lycæna argiolus and Pararge egeria.—On March 26th I captured a very fine specimen of *L. argiolus*. It had evidently only just emerged, and was flying round a *Cedrus deodora* in front of this house. The "azure blue" is a common butterfly in the woods of Curraghmore, the demesne of the Marquis of Waterford, in my parish. It occurs regularly every spring, but some years it is far more plentiful than in others. I have often looked for it during the summer months, but it does not make a second appearance here. I saw a specimen of *P. egeria* in my garden on the 8th of this month. These two dates are the earliest respectively on which I have seen these butterflies.—(Rev.) William W. Flemyng; Coolfin, Portlaw, Co. Waterford, April 10th, 1894.

Early Appearance of Lycæna argiolus.—On Saturday afternoon, April 7th, I captured a freshly-emerged female *L. argiolus*, flying round a variegated holly in the garden. Can anyone give an earlier date for the appearance of this insect?—H. W. Shepheard Walwyn; Bidborough, near Tunbridge Wells.

RECENT LITERATURE.

Transactions of the City of London Entomological and Natural History Society for the year 1893, pp. 59, xxii. The London Institution, Finsbury Circus.

Among various other matters of interest which form the contents of this modest little publication are some excellent papers, which are well worth the attention of those entomologists who may not yet have read them in the journals in which they were originally published. Dr. Buckell's learned dissertation on "Specific Nomenclature—Past, Present, and Future," and instructive essay entitled "The History of Butterfly Classification," will be of great value to the student seeking knowledge on these matters. Mr. Robson's paper, "Is Moisture the Cause of Melanism?" is interesting, and a useful contribution; whilst Mr. Tutt's diatribe "Melanchroism in British Lepidoptera" is characteristic but not convincing. Coleopterists will be interested in "Notes on certain Coleopterous Insects found in City Warehouses," by Mr. G. A. Lewcock; and "The genus Silpha, *Linné*," by the Rev. W. F. Johnson.

Chinese Central Asia: a Ride to Little Tibet. By Henry Lansdell, D.D., M.R.A.S., F.R.G.S., Author of 'Through Siberia,' 'Russian Central Asia,' 'Through Central Asia,' &c. With 3 maps and 80 illustrations. London: Sampson Low, Marston & Co., Ltd. 1893.

An interesting narrative of the more important portion of Dr. Lansdell's third great journey of 50,000 miles, during which he visited every kingdom of Asia, five of Europe, and four of Africa. Although the traveller's primary objects were missionary, he did not neglect science; and the Appendix to the second volume contains an important list of the Lepidoptera of Chinese Turkistan, compiled by Mr. Bethune-Baker, partly from German and Russian sources.

THE ENTOMOLOGIST

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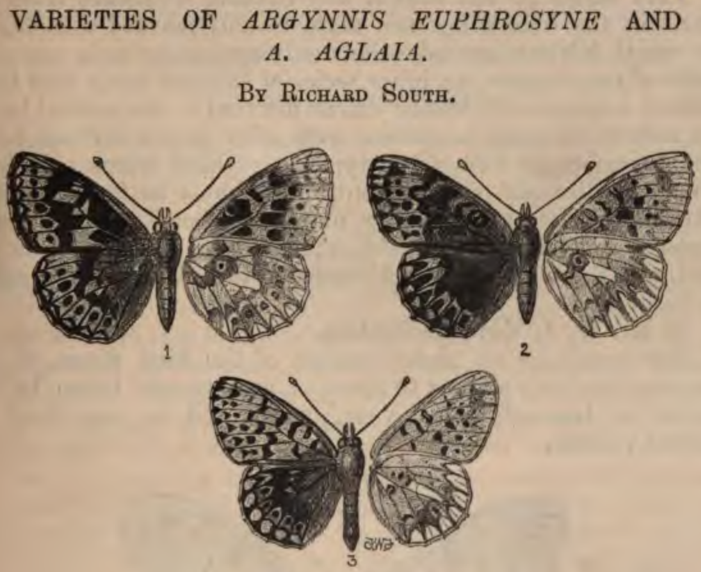
VARIETIES OF *ARGYNNIS EUPHROSYNE* AND *A. AGLAIA.*

By Richard South.



Argynnis euphrosyne, vars.

Figure 1.—Female, captured in a Kentish wood, June, 1890. Ground colour typical. Fore wings have the discoidal cell almost entirely filled up with black, and there is a quadrate spot of the same colour below it; the spots forming the central series are large and united; submarginal series of spots typical, but the marginal markings are somewhat similar in character to those of female *A. selene*. Under surface almost typical, except that the discal black markings of fore wings are very large.

A very similar aberration of the male was taken in the same wood about 1879. The chief differences between these two specimens, which are both in my collection, is that in the latter the nervules on marginal area of both wings are broadly black.

Figure 2.—Female, taken at West Wickham, May, 1887.

All the wings are of the typical ground colour, but suffused with black as far as the central band; on the outer third, especially of the hind wings, the round black spots of inner series are united with the triangular spots beyond, and these last are more or less connected with the marginal spots. On the under surface the marginal silver spots of hind wings are very large, and the upper ones are capped with bright chestnut; some of the reddish marks on basal area are replaced by pale buff.

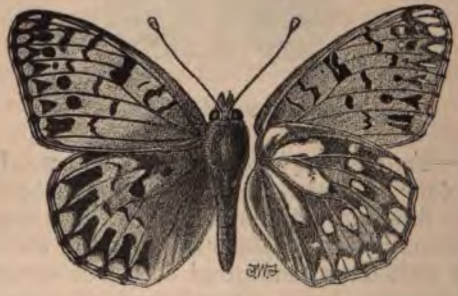
In the collection of Mr. Frohawk, who captured the specimen.

Figure 3.—Male, taken in Epping Forest, May, 1889.

Fore wings do not exhibit any striking difference from the type, but the hind wings are more heavily marked with black; the usual fulvous ground colour only appearing as a marginal series of round spots, an inner series of suffused spots with black centres, and some ill-defined marks internal to the central band; the abdominal area is clothed with silky bright fulvous hairs. Under surface of fore wings typical: of hind wings pale buff; the silver discoidal spot is continued almost to fourth spot of marginal series, all of these marginal spots are large, and bordered and edged with reddish; the basal silver spot is distinct, and there are indistinct traces of the usual reddish marks on basal area.

In Mr. W. J. Mead's collection.

The markings on under surface of the hind wings of this specimen are very similar to those of an example taken by Mr. Baynes in Lancashire last year, and figured on page 1 of the present volume.



Argynnis aglaia, var.

The above figure represents the variety of *Argynnis aglaia* described by Mr. Fowler (*ante*, p. 131). In the blotched character of the silver markings on the under surface of hind wings this specimen is somewhat similar to the variety of the species known as *charlotta*, and referred to by Westwood and Humphreys as follows:—

"*Pap. charlotta* of Haworth (Lep. Brit., p. 32; Sowerby, Brit. Misc., pl. 11; Bree in Loudon's Mag. of Nat. Hist., v., 150: *Arg. charlotta*, Jermyn), represented in our plate 12, figs. 1–2, is regarded by Stephens and Curtis as a var. of this species (*A. aglaia*), differing from it in having two of the costal spots on both sides of the fore wings united, and only nineteen instead of twenty-one silvery spots on the under side of the hind wings, several of the ordinary spots at the base being confluent."

ON SOME BUTTERFLIES OCCURRING IN THE GOVERNMENT OF ST. PETERSBURG.

By Boris M. Menshootkin.

In the 'Entomologist' for January last (*ante*, p. 1) Mr. South figures and describes a variety of *Argynnis euphrosyne*, and it may therefore be interesting to record a similar variety of *A. selene* taken by myself in the Government of St. Petersburg. On the upper surface the fore wings are of the same brown colour as in typical *A. selene*, but tinged with grey-brown at the base; the discoidal cell has two yellow-centred black spots, one at the outer end and one some three millimetres from it, but not quite in the middle of the cell; the submarginal area in the lowest part has three distinct spots, of which the first two are elongated and have the appearance of arrow-heads, the others are merged together and indistinct; the marginal line is black, with black dots on the nervules uniting in the upper part with the submarginal line, and enclosing spots of yellow between the nervules. Hind wings: basal area almost wholly black, the centre is clothed with black hairs, and all the nervules are black, some broad and diffuse, others finer and sharper; between them is a row of black spots uniting with the nervules, and giving the appearance of a black transverse band. Under surface similar in many respects to that of typical *A. selene*, but there are no black patches on the outer margin of fore wings; on the nervules the yellow deepens only to greyish brown, and slight yellowish grey patches are seen on the submarginal row of dots; the marginal line itself is black, very thin and distinct: hind wings have the nervules very sharply defined; the outer marginal area looks faded, and there are little patches of brown on the nervules forming a submarginal band interrupted in the middle.

So far as I know, this form of *A. selene* has not been previously described; it appears to be very local, and certainly has not been caught here for the last five or six years. I have examined many collections of butterflies, but have only seen one other example of this variety, which was taken near Gatchina in 1888, the same year that I took the example described above at our country residence some fifteen versts (about ten miles) south from the town Louga, and not more than sixty or seventy versts (about forty-five or fifty miles) from Gatchina. My specimen has been presented to the zoological collection of the Imperial University of St. Petersburg, where a complete collection of butterflies of our Government is now formed by a number of students of the University. A list of all the Lepidoptera in this collection will shortly be published.

I should also like to record the occurrence of two other species of Rhopalocera in the Government of St. Petersburg, *i.e.*, *Parnassius mnemosyne* and *Polyommatus dispar* var. *rutilus*. The former of these two butterflies is widely spread over Russia. Beginning from Finnland, it goes down the Volga. Almost all collections from St. Petersburg contain some specimens of this species, but it is nevertheless very local, and is generally found on high river-banks. For instance, in the neighbourhood of Louga there are only three or four places where it is to be found, each year about the 1st of June. From a distance this butterfly may be easily mistaken for *Aporia cratægi*, which is very plentiful with us, and appears about the same time of the year.

The other butterfly, *Polyommatus rutilus*, was caught by myself for the first time in the Government of St. Petersburg, on our estate near Louga, on the 12th of July, 1892. This interesting specimen I have also handed over to the collection of the University.

I may mention that the following species of Lepidoptera, all of which were found by me, have been also added to the fauna list of St. Petersburg within the last three years:—*Apatura iris*, *Macroglossa stellatarum*, *Spilosoma luctifera*, and *Brotolomia meticulosa*. The first of these, *Apatura iris*, was caught once in 1837, if I remember rightly, but since then supposed to be extinct in St. Petersburg. In the year 1890, towards the end of June, a great number of this species appeared on our estate, but nowhere else; my best specimens are in the University collection. *Pieris daplidice* occurred in 1892 all over the Government, but until this it had never been observed with us. It was as plentiful as *Pieris brassicæ* and *P. rapæ* usually are.

St. Petersburg University, Jan. 30, 1894.

THE NEW ENTOMOLOGY.

By W. F. de Vismes Kane, M.A., M.R.I.A., F.E.S.

Mr. Sharp's address on this subject, which has fortunately been given a wider publicity in these pages than the Proceedings of the Society to which it was delivered would have secured, needs no such apology as that with which it concludes. A purview of recent additions to our lists of species has doubtless much interest, but Mr. Sharp's concise review of the field for scientific speculation offered by Entomology is of much weightier import, and as such will be welcomed. The complex nature of zoological enquiries inevitably gives rise to diversified speculations, many of which may fade in the light of further accumulations of evidence; but the converging rays contributed by researches into biological phenomena in various departments of the science must eventually lead to important results. Investigations into the morphology of insects offer, as the writer points out, peculiar opportunities for experimental research; and although Palæontology has of course preserved more scanty and fragmentary testimony with regard to the evolution and ontogeny of insects than of most other classes, yet the modern phenomena of variation which they display so widely are so capable of examination that ere long we may hope this favourite study will furnish valuable clues to some secrets of Nature. The thickness and wide areas of extension of geological formations witness to enormous epochs, not more trenchantly than the persistence, even to the present date, of characters presumably impressed on certain races of plants and insects during the lapse of the glacial ages; though surviving in latitudes and situations wholly differing for thousands of years past in climatal and other environment. But, on the other hand, there are species of Lepidoptera which appear to be in a most unstable condition; and some are apparently rapidly conforming under our eyes to changed conditions of environment under stress of natural selection and heredity.

These two classes of phenomena seem to challenge solution by the followers of the two schools of philosophical speculation represented by Mr. Herbert Spencer and Professor Weismann respectively. An instance of the persistence of acquired characters under change of environment is afforded by the occurrence in Scotland and Ireland of the alpine variety *montivaga* of *Acronycta euphorbiæ*. It is generally believed to have acquired its varietal traits during the glacial epochs, and transmitted them through its descendants who settled in these islands before they were insulated from the European mainland. But while it is explicable enough that the variety still persists on the Alps under approximate subarctic conditions, while the type prevails in the lowlands, how comes it that even in the South of Ireland, with a climate more southern than its latitude represents, no reversion to the type has taken place in the lapse of cycles of centuries? The variation acquired under pressure of the environment has apparently so impressed itself on the organism that succeeding ages of pre-glacial climate have not erased the hereditary traits.

The phenomenon probably would not have been displayed if isolation had not segregated the variety in these islands from admixture with the lowland continental type. It is of course, however, open to discussion whether the alpine form or the so-called type is the more primitive one. In either case, however, we seem to have an instance of the persistence of acquired characters. On the other hand, as above remarked, melanic variations are credibly asserted to be rapidly developing in smoky districts. These and similar facts require careful investigation, and students of such phenomena should carefully try to distinguish what appears to be a hereditary and constitutional bias, giving rise (often sporadically) to fixed types of variation, whether sexual or otherwise, such as the var. *valesina* of *Argynnis paphia*, and the named ones of *Apamea oculea*, from such occasional topomorphic forms whose origin may be traced to local influences.

In referring, however, to the views of Professor Weismann and Mr. Herbert Spencer, Mr. Sharp gives a very inadequate and therefore misleading analysis of the theories under discussion lately in the 'Contemporary Review.' Inadvertently, doubtless, he summarises the German biologist's thesis thus baldly:—"All specialized forms are the result of the pressure of the environment acting through heredity"; while "acquired variations are not transmitted." It seems unfortunate that so incomplete a definition of the very abstruse speculations of the celebrated author should have been put forward without qualification or explanation. To a reader ignorant of the subject, it seems a contradiction of terms to speak of heritable varieties, if variations are not transmissible. Of course Mr. Sharp's reference to the subject is a merely passing one, but it conveys an inaccurate impression of the real issue. Professor Weismann, whose essay is styled "The All-sufficiency of Natural Selection," contends that modifications of structure arise from fortuitous variations of germinal products, uninfluenced either by the action of the environment, or by functional use or disuse, but springing solely from constitutional tendencies of the parents not immediately referable to any assignable stress of external influences. These chance variations of offspring are pruned by natural selection, which secures the survival of the fittest. The English philosopher, on the other hand, contends in favour of the Lamarkian principle of the heritability of variations arising from use and disuse of functional attributes, as well as from external influences; and he shows that in the social Hymenoptera one set of differences in structure and instinct is determined by nutrition before the egg is laid, and a further set by nutrition after the egg is laid. And further, from the partial and in other cases total abortion of the hind limbs of whales, towards which result no defect of nutrition can be alleged as cause, he argues that Professor Weismann's theory of "panmixia" affected by selection is inadequate to account for more than the partial suppression of the hind limbs of cetaceans, but that it must be the result of the disuse of those appendages, together with the inheritance of characters so acquired.

The modern school of entomologists generally appears to lean strongly towards the latter school of thought, often perhaps overshooting the mark by referring all variations to the immediate action of present environment. It seems probable that if more attention were paid to insular fauna, some of these problems might find solution.

A more careful and accurate study of Irish insects, for instance, seems most advisable. Mr. Nicholson's thoughtful and valuable paper on Corsican butterflies, which follows that of Mr. Sharp (p. 116), is very suggestive in this respect. *Ex. gr.*, it would be interesting to learn if the phenomena of *Vanessa urticæ* var. *ichnusa* being restricted to a single brood in a climate possessing a summer of so long duration may be accounted for by the fact that the food plant is well known to be scorched very early in the year by the powerful sun of Corsica. Also whether the species is perpetuated by the long-lived female imagines surviving the whole summer (perhaps æstivating ?) and winter, or whether a portion of the pupæ are delayed in emergence.

That the larvæ are to be found through a considerable period (*teste* Mr. Nicholson) is probably due to the insufficient nutriment afforded by the withering food plant, as well as by its irregular survival in moist and shaded spots. These observations bear out Mr. Sharp's remarks as to the necessity in future of restricting somewhat the scope of individual labours in the entomological field. To solve such problems as have been alluded to, we require the aid of patient and continuous investigation into the particular facts of each case; and there is ample witness of the increase of scientific students who are contented to limit their enquiries to special groups of phenomena. To such all honour is due.

A NEW CLASSIFICATION OF THE GENUS *THORACANTHA*, Latr.

By John W. Shipp.

As the genus *Thoracantha* is in a great state of confusion, and as so many species generically distinct are all included under this most interesting genus, I have been induced to give a new classification, dividing the existing species under new genera, as follows:—

I. Species having the head tuberculated . .	Isomerala, n. g.
II. Species having the head simple.	
A. Scutellum as long as abdomen, the scutellary projection being very broad, as wide as thorax at the base, and with the apex divided.	
a. Thorax not pubescent, apex of the scutellary projection very sharply cleft or notched .	Thoracantha, Latr.
b. Thorax pubescent; apex of the scutellary projection rounded and not sharply cleft, the notch extending two-thirds of the entire length	Dilocantha, n. g.
B. Scutellary projections as wide as thorax at base, each side being produced into a long contiguous spine, tapering at extremity, and generally longer than abdomen.	
a. Head not so wide as thorax; eyes normal .	Lasionycus, n. g.
b. Head as wide as or wider than thorax; eyes distinctly projecting.	
aa. Third joint of the antennæ longer than all the others together; antennæ ten-jointed	Lirata, Cameron.
bb. Third joint of antennæ not much longer than the fourth; antennæ eleven-jointed	Kapala, Cam.
C. Scutellary projection with the basal portion as wide as thorax, shortly compressed in centre, then dilated, and the apex furnished with two rounded short spines .	Lætocantha, n. g.
D. Scutellary projection with the basal portion as wide as thorax, produced, and with the sides parallel. The apex is furnished with a small semicircular excavation, the apices of the two spines being very sharp	Acrostela, n. g.

Isomerala, mihi.

coronata (type), Westw., Thes. Ent. p. 154, pl. xxviii. f. 10. Hab. Bahia, Amazons.

THORACANTHA, Latr.

Cuvier's Règne Anim. ed. 2, v. p. 297.

Galearia, Brullé, Spec. Hym. iv. p. 592.

latreillei (type), Guerin, Icon. Règne Anim. Ins. p. 415, pl. lxvii. f. 8; Walker, Ann. Mag. Nat. Hist. xii. 1843, p. 45; vel *coleopteroides*, Waterh., Trans. Ent. Soc. ii. p. 196, pl. xvii. f. 3.

violacea, Brullé, Spec. Hym. iv. pl. xxxviii. fig. 6, 6*a*–*b*.

Hab. Brazil.

DILOCANTHA, mihi.

flavicornis (type), Walker, Trans. Ent. Soc. (3), 1862, i. p. 382; Westw., Thes. Ent. p. 153, pl. xxviii. fig. 4, 4*a*–*b*.

Hab. Villa Nova, Brazil. (Type in B. M.)

LASIONYCHUS, mihi.

flabellata (type), Westw., Proc. Zool. Soc. 1835, p. 52.

aculeata, Blanch., Cuv. Règne Anim. ed. Croch. Ins. p. cxiii. f. 8; Westw., Thes. Ent. p. 154, pl. xxviii. fig. 9.

Hab. Amazons. Brazil. (Type in Mus. Oxon.)

LIRATA, Cameron.

Bio. Centr. Amer. Hym. i. p. 102.

striatissimus (type), Walker, Trans. Ent. Soc. (3), 1862, i. p. 380.

luteogaster, Cam. (*flaviventris*, Cam. err. *l. c.*), Bio. Centr. Amer. Hym. i. p. 102, pl. v. figs. 16, 16*a*.

Hab. Panama.

KAPALA, Cameron.

Bio. Centr. Amer. Hym. i. p. 102.

Chirocerus, Brullé (nec Latr.), Ins. Hym. iv. p. 571.

furcata (type), S. Fabr., Syst. Piez. p. 158; Haliday, Ent. i. pl. P, figs. 22*a*–*c*; Cameron, Bio. Centr. Amer. Hym. i. p. 103, pl. v. figs. 17, 17*a*–*d*.

Hab. South and Central America.

LÆTOCANTHA, mihi.

nasua (type), Walker, List Hym. in B. M. i. 1846, p. 88.

Hab. Brazil. (Type in B. M.)

ACROSTELA, mihi.

apta (type), Walker, Trans. Ent. Soc. (3), 1862, i. p. 384; Westwood, Thes. Ent. p. 153, pl. xxviii. f. 3.

Hab. Sahtarem, Villa Nova. (Types in B. M. and Mus. Oxon.)

Thoracantha pallescens, Walker (Trans. Ent. Soc. (3), 1862, i. p. 379), and *T. surgens*, Walker (*l. c.* p. 384), will have to be referred to *Lirata*, Cameron.

The figures of *Lirata luteogaster*, Cameron (*striatissimus*), in the Biologia Centrali-Americana, Hym. i. pl. v. figs. 16, 16*a*, are slightly misleading. The basal portion of the antennæ is yellowish, in some examples a bright yellow. Although I have not seen a specimen of *Uromelia striata*, Perty, I should think it probable that the apex of the scutellary projection is notched or divided. If so, it will in all probability be identical with *Thoracantha aculeata* (*flabellata*), Westwood.

Oxford, 1894.

SIX YEARS' ENTOMOLOGY IN CO. GALWAY.

By the Hon. R. E. Dillon.

(Concluded from p. 171.)

Euclidia glyphica. Common.

Epione parallellaria. Two specimens, bred, June, 1892.—*A. apiciaria.* Several specimens taken by Mr. Kane, at sugar and flying, July, 1893.

Venilia macularia. Several specimens taken round apple trees in the garden.

Angerona prunaria. Common. I have bred many from larvæ found on bramble. Pale varieties as common as the typical form.

Ellopia prosapiaria. I have only two good specimens, but have netted several very worn examples in August.

Eurymene dolobraria. Fairly common; larvæ very common, except in 1893. I took about a dozen imagines in moth-trap, May, 1893.

Pericallia syringaria. Two specimens: (1) July, 1891; (2) June, 1893.

Selenia lunaria. Two, April, 1891, at light. — *S. tetralunaria.* Several specimens, at different times from 1890–1893.

Eugonia fuscantaria. Fairly common.—*E. erosaria.* Four specimens.—*E. quercinaria.* Not uncommon.

Nyssia zonaria. A female having emerged in my breeding-cage, August 19th, 1891, I took her in a box where the larva had been found. On returning within an hour I found a male adhering to the box; delighted at my capture I prepared them for my cabinet, neve thinking even of breeding from them.

Biston hirtaria. Two specimens, on the window of a staircase attracted by a lamp within; one almost totally destroyed by burning and oil.

Amphidasys strataria. Fairly common, on windows and in moth-trap.—*A. betularia.* Common,

Boarmia cinctaria. Two specimens.

Tephrosia punctularia. One specimen. Mr. Kane took a remarkable form here, April 7th, 1893.

Gnophos obscuraria. Several specimens at different times.

Geometra papilionaria. Not uncommon.

Hemithea strigata. One specimen, flying on the brow of a bog.

Zonosoma orbicularia. I have taken about a dozen, both flying in daytime and at dusk; four in 1893.—*Z. pendularia.* The only specimen taken was netted by Mr. J. V. Hart, Q.C., in July, 1893.

Hyria muricata. In all eight specimens have been taken here: two on a larch tree, within fifteen yards of the house; three in June, 1893, by the gamekeeper on the bog; the rest by the ladies of the family, who have always kindly set insects for me in my absence.

Venusia cambrica. One specimen.

Acidalia dimidiata, A. virgularia, A. subsericeata, A. immutata, A. fumata, A. remutata. Single specimens of each. I could not identify these and other Geometers; Mr. Kane determined them.—*A. aversata.* Common. Several specimens tend towards the Scotch form.

Timandra amataria. Not common; two or three seen yearly.

Bapta temerata. Not uncommon; I took about a dozen in the spring of 1893.

Macaria liturata. Very common in fir woods on the estate.

Panagra petraria. Not uncommon.

Selidosema ericetaria. Only one specimen, on a bog near the river.

Scodiona belgiaria. One specimen in the moth-trap, May, 1893.

Abraxas sylvata. One specimen, at sugar, 1892.

Hybernia defoliaria. Not uncommon.

Cheimatobia boreata. I have just received two specimens from Mr. Kane, which he identified for me. I had previously sent him several examples of *C. brumata*, which I had considered "*boreata.*"

Oporabia filigrammaria. One specimen, at light.

Larentia salicata. Two specimens taken before 1892; these were not identified until Mr. Kane's visit in April, 1893.—*L. olivata.* One specimen flying at dusk.

Emmelesia alchemillata. One specimen.—*E. albulata.* Not uncommon.

Eupithecia pulchellata. Two specimens. — *E. isogrammata.* One specimen.—*E. virgaureata.* Two specimens.—*E. fraxinata.* One specimen.—*E. indigata.* Several specimens.—*E. debiliata.* One specimen.

Lobophora halterata. Two specimens. — *L. carpinata.* Not uncommon.—*L. sexalisata.* Two, July, 1893.

Thera juniperata. Moth-trap, August, 1893.—*T. simulata.* Also in moth-trap.

Hypsipetes ruberata. One specimen, June, 1893. — *H. trifasciata.* One specimen.

Melanthia bicolorata. Common. — *M. albicillata.* Not uncommon. *M. hastata.* Two specimens; not uncommon.

Melanippe unangulata. Four specimens netted, August, 1893.

Coremia munitata. One specimen.—*C. designata.* Common.

Camptogramma fluviata. August, 1893.

Phibalapteryx vitalbata.—One specimen, taken flying round a turret of the old Clonbrock Castle, where *Clematis vitalba* grows commonly. June, 1893.

Triphosa dubitata. Only two good specimens. I have taken worn ones at different times.

Tanagra atrata. Not common; one or two seen yearly.

NOTES ON THE SYNONYMY OF NOCTUID MOTHS.

By Arthur G. Butler, Ph.D., F.L.S., &c.

(Continued from p. 49.)

Ercheia, *Walk.*

To this genus belong *Achæa sypnoides*, *Sypna complicata*, *Achæa subsignata*, *Ercheia umbrosa* and *charon* (which may possibly not be distinct from *E. dubia*), *Achæa cyllaria*, and *Ercheia diversipennis*.

Ercheia cyllaria.

Phalæna cyllaria, Cramer, Pap. Exot. iii. p. 100, pl. ccli., figs. c, d.
Achæa cyllota, Guenée, Noct. iii. p. 248, n. 1669 (1852).
A. fusifera, Walker, Lep. Het. xiv. p. 1398, n. 16 (1857).
A. signivitta, Walker, *l. c.*, n. 17 (1857).
A. polychroma, Walker, *l. c.*, p. 1400, n. 21 (1857).
Ercheia tenebrosa, Moore, Proc. Zool. Soc. 1867, p. 66.

Moulmein, Ceylon, Andamans, Nilgiris, N. W. Himalayas, Darjiling, Borneo. In Coll. B. M.

The extreme variability of the upper surface of the primaries in this genus is now well known; the spotting of the secondaries above and the pattern of the under surface can alone be relied upon.

Ercheia diversipennis.

Ercheia diversipennis, Walker, Lep. Het. xiii. p. 1108 (1857).
E. pannosa, Moore, Proc. Zool. Soc. 1883, p. 24.
E. zura, Swinhoe, Proc. Zool. Soc. 1885, p. 465.
E. zygia, Swinhoe, *l. c.*

Nilgiris, Bombay, Poona, Canara, Ceylon. Type in Coll. B. M.

This species varies much in the same way as the preceding, from which the pattern of the secondaries is the chief distinguishing character, the three white spots across the centre being more or less united into a band. Whether this distinction can be maintained when long series of both forms have been received, remains to be proved. At present, *E. diversipennis* holds its own as a fairly distinct form from *E. cyllaria*. The forms associated above differ only in the pattern of the primaries, which is undoubtedly as variable as in the other species of the genus.

Ophiodes, *Guen.*

Ophiodes mejanesi.

Ophiodes mejanesi, Guenée, Noct. iii. p. 232, n. 1641 (1852).
Ophisma expedita, Walker, Lep. Het. xiv. p. 1375, n. 15 (1857).

Var. *Ophiusa tumidilinea*, Walker, *l. c.*, p. 1433, n. 32 (1857).
Africa and India. In Coll. B. M.

O. hopei, Boisduval, from Madagascar, if distinct, must be a very closely allied species to the above.

Ophiodes selenaris.

Ophiodes selenaris, Guenée, Noct. iii. p. 232, n. 1640 (1852).
Ophiusa ? obhærens, Walker, Lep. Het. xiv. p. 1830 (1858).
South Africa. In Coll. B. M.

Ophiodes finifascia.

Nephelodes finifascia, Walker, Lep. Het. xv. p. 1676 (1858).
Anua amplior, Walker, *l. c.*, p. 1789 (1858).
Ophiusa dilecta, Walker, *l. c.*, Suppl. 3, p. 967 (1865).
South and West Africa. Types in Coll. B. M.

Ophiodes tirhaca.

Phalæna tirhaca, Cramer, Pap. Exot. ii. pl. clxxii., fig. E (1779).
Noctua tyrrhæa, Fabricius, Sp. Ins. ii. p. 213, n. 19.
N. vesta, Esper, Eur. Schmett. iv. pl. cxli., fig. 1.
Ophiodes hottentota, Guenée, Noct. iii. p. 229, n. 1635 (1852).
O. separans, Walker, Lep. Het. xiv. p. 1357, n. 9 (1857).
Europe, Asia, South Africa, Madagascar. In Coll. B. M.

Fabricius' blunder in quoting Cramer's name has been copied with slight variations up to the present time. The absurdity of separating the sports of this species under different names is evident directly that one obtains a good series of specimens.

Ophiodes klugii.

Ophiusa klugii, Boisduval, Faune Ent. de Madag. p. 103, n. 5; Maillard, Notes sur l'Ile de la Réunion, pl. xxiii., fig. 1 (as *Ophisma klugii*).
Ophisma rivularis, Butler, Ann. & Mag. Nat. Hist. p. 407, n. 82, note (December, 1875).
Western Africa. In Coll. B. M.

LAGOPTERA, *Guen.*

Lagoptera juno.

Noctua juno, Dalman, Anal. Entom. p. 52, n. 29 (1823).
Ophiusa elegans, Van der Hoeven, Lép. Nov. pl. 5, figs. 6 *a*, *b*.
Lagoptera multicolor, Guenée, Noct. iii. p. 226, n. 1631.
Japan, China, and India. In Coll. B. M

(To be continued.)

ON THE LARVA OF *TRITOMA (CYRTO-TRIPLAX) BIPUSTULATA*, FAB.

By the Rev. H. S. Gorham, F.Z.S., &c.

On the 10th of May in the present year, I found a colony of *Tritoma bipustulata*, Fab., together with a number of larvæ which I believe to be those of the *Tritoma*, though I have not yet reared any. I believe the larva of this insect has not been described, and I will therefore give a short description of these larvæ. Length from 7 to 8 mm., rather fat, whitish, the head brown, and each of the twelve segments succeeding with a brownish transverse patch, not extending so far as the spiracles, the patches intersected by a narrow dorsal white line. The prothoracic segment, *i. e.*, the first after the head, and the last, with the brown patch wider, and on the last are two reddish tubercles. Feeding on the *Polyporus*, on a stump in which were about twelve mature *Tritomas*. The larva consists of twelve segments and the head, the thoracic legs well developed; the merest rudiments of antennæ exist, consisting apparently of one short thick joint, with a seta.

The Chestnuts, Shirley Warren, May 16th, 1894.

NOTES AND OBSERVATIONS.

Variation of Tæniocampa gothica.—Last month Mr. Rose, of Barnsley, sent me for inspection a very extensive series of *Tæniocampa gothica* which he had recently bred from ova deposited by a female sent to him in the spring of 1893, by Mr. Salvage, from Perthshire. All the specimens are larger than usual, and in colour are more uniformly brownish. In some examples the characteristic black mark of typical *gothica* is simply represented by a black bar between the reniform and orbicular stigmata. In other specimens there is a thin continuation under the orbicular, forming an L-shaped mark, whilst in a few examples this mark is only indicated by a black spot between the stigmata and one following the orbicular. In the majority of the specimens, however, the "hebrew character" is hardly darker than the ground colour (var. *gothicina*), and in one or two can scarcely be traced. Altogether this is the most interesting series of *T. gothica* I have yet had the pleasure of seeing.—Richard South.

Orthosia witzenmanni.—I lately sent two coloured sketches of the two forms of the species resembling *Tæniocampa munda* (Entom. 179) through my cousin, to his friend, Herr R. Püngeler, of Rhedyt, Germany, to see if he could throw any additional light on the subject. Herr Püngeler, in his letter of April 21st, says they are undoubtedly specimens of *Orthosia witzenmanni*, Standfus, Mitth. Schweiz. e. 1890, p. 233. He states the author described the species from two males taken near Digne, Basses-Alpes, that it resembles *Tæniocampa munda*, and can be either reddish or grey.—FRANK BROMILOW; Villa Avalon, St. Maurice, Nice, France, May 6th, 1894.

SWARMING OF VANESSA POLYCHLOROS.—Previous to the spring of 1893 *Vanessa polychloros* was comparatively rare in this district, and I had seen but very few. All through from March 14th into April of 1893 the species was very commonly met with in the forest; but during the spring of this year it has been in greater abundance; I have, however, rarely seen it outside the forest. The dates of first and last appearance up to to-day, and the numbers seen, were as follows:—March 11th, wind S.W., fine; two specimens at Linford within a few yards of each other; a female, very bright and in good condition; male rather small. A few at various times up to the 17th, when the wind was N.E., previous night cold, but sky clear and warm sunshine during the day; on this occasion *V. polychloros* was plentiful, though scattered. March 19th, plentiful; I saw nine specimens upon an isolated male sallow-bush; one or two were feeding upon the catkins, and two pairs by their well-known movements were evidently about to copulate; a few flew away and settled upon the ground. March 23rd, about a mile west of Boldrewood, in a narrow riding, I came across two fine birch-trees amongst oaks and firs, and upon these birches I saw a large assembly of *V. polychloros;* I counted above twenty-five, and upon the bare branches there were several pairs *in cop.* their dark wings being quite visible; on kicking the trees a number flew off, circled round, and settled again. In this case there were no catkins to feed upon, and I think there is no doubt they were assembled for the purpose of copulating, all their movements indicating it; they did not settle upon the other trees around. 25th, abundant at sallow, creeping amongst the upper twigs, and evidently about to oviposit. 29th, still common. April 1st, in lesser numbers, getting worn. April 8th, found a batch of ova upon sallow, all of which hatched on the 12th. April 10th, saw several very dilapidated imagines; and on the 19th another batch of ova was found, which I sent to Dr. Chapman; these eggs were just changing to the larval colour. 21st, in the Boldrewood locality, one specimen only, its gay colour quite gone, but flight still vigorous; this was the last specimen seen up to date. In writing the above I have acted upon the kind suggestion of Dr. Chapman that I should do so, as it would seem to be unusual for any of the Vanessidæ to be seen swarming during the spring. I did not notice any appearance of this butterfly swarming during the spring of 1893; previous to the last two seasons I had very little experience with this species.—J. HY. FOWLER; Ringwood, April 23rd, 1894.

GREASE IN THE THORAX.—Lepidopterists will feel grateful to Dr. Knaggs for his instructive article entitled "How moth-grease spreads" (*ante*, p. 91). The information there given respecting the cause of greasy thoraces, will prove especially valuable to collectors, and enable them in a great measure to prevent it. Dr. Knaggs has clearly pointed out that the mischief is due to unskilful pinning, and close scrutiny will show that he has "hit the right nail on the head." It is by no means an easy task to find out the centre of fluffy thoraces like *Biston hirtaria*, *Notodonta* (*Peridea*) *trepida*, the Bombycidæ, and suchlike, the difficulty being often increased by the bluntness of the black entomological pins with which manufacturers are so good as to supply us, the pin sliding off the hard and slippery thorax into the softer part of juncture with the abdomen. It is certain that the badly made, blunt pins are the cause of much bad pinning. Grease, I am sure, is greatly increased by the use of camphor. For some years I have discarded it, substituting naphthaline, and my specimens have been much freer from the unsightly nuisance in consequence.—JOSEPH ANDERSON, Chichester.

THE ECONOMY OF CERTAIN DIPTERA.—*Macquartia affinis*, Macq., has been bred by Mr. Keys, of Plymouth, from the larvæ of *Chrysomela varians*. *Heteroneura albimana*, Mg., I have bred more than once from little red pupæ found in rotten wood. *Scatopse albitarsis*, Zett., can be bred in numbers from the pith of burdock stems. *Ceratopogon niveipennis*, Mg., can be bred in numbers from the pith of teazel stems. *Tephritis plantaginis*, Hal., is certainly attached to *Aster tripolium*, on which it occurs in numbers.—C. W. DALE; Glanvilles Wootton, April 14th, 1894.

PYRAMEIS GONERILLA KILLED BY FLYCATCHERS.—While collecting, on the 5th of the present month, in Mr. Bullock's garden near Ashburton, I witnessed an event in bird and butterfly life new to me. A large plant of the introduced *Veronica andersoni*, in full flower, growing on the lawn, was a great attraction to numerous insects, especially Diptera and Lepidoptera. On the flowers were several *P. gonerilla*, whose bright colours and graceful motions are always a "thing of beauty" to me. A pair of native flycatchers (*Rhipidara flabillifera*), attracted by the numerous insects, hovered about the bush, occasionally settling among the foliage, and darting out to capture some of the insects as they came to the flowers. We had remained about the bush, netting and bottling Diptera nearly an hour, before we observed the fantails dart at *gonerilla*. Previous to their doing so, we noticed them capturing Diptera, and ineffectually pursuing a pale-coloured species of *Mamestra* of semi-diurnal habits. The first attempt to capture *gonerilla* was unsuccessful. Both butterfly and bird darted swiftly over and around the high bush, and once passed close to my face. I distinctly heard the repeated snapping of the minute bill of the fantail during the chase. After a few minutes' respite and excited twitter among the branches, the fantail darted at a second butterfly. The latter seemed to blunder against the flower, and, unfortunately, was captured by the bird. At the moment of capture I struck lightly at the bird with my net, and the butterfly fluttered down through the foliage and I secured it. On examination I discovered its abdomen to be burst, and its intestines slightly protruding. Entomologists may say, perhaps, that there is nothing remarkable about the occurrence. However, after many years' study in the field of bird and insect life in New Zealand, I can only say that I have not previously seen the graceful little fantails attacking such large insects; nor have I ever previously seen them on the open plains in summer. Leaving aside the probable cause of their presence here in midsummer, I may add that Sir Walter Buller has fully described the airy evolutions of these birds while "they hawk for invisible flies," on the outskirts of the native bush. There is another phase of the case which I may mention: I have frequently netted numbers of *gonerilla* with irregular notches in both the fore and hind wings. As already stated, I distinctly heard the snapping of the fantail's bill when pursuing the butterfly, and I think there can be little doubt that the notches are occasionally produced by these birds, and perhaps other species.—W. W. Smith; Ashburton, New Zealand, January, 1894.

"Cork Carpet" versus Cork.—Some of your readers may be able to inform me if there is any objection to "cork carpet" as a substitute for cork, other than its comparative weight, which surely cannot be a very great obstacle against its employment, or we should build our cabinets of a lighter wood than mahogany, and use thinner glass than "flatted sheet" or "British plate." Boxes lined with this material have reached me from correspondents and, so far as I can judge, it appears to be peculiarly adapted for lining cabinet drawers and boxes, as well as for making saddles, for it is very readily shaped by rasp, file, or sand-paper. Its advantages compared with cork are, firstly, that it is much cheaper; secondly, that it does not consist of a number of pieces which have to be fitted together and then smoothed down to level surface; thirdly, that it has neither holes nor hard points; and, fourthly, perhaps, that it is thicker than the cork usually employed, thereby allowing a greater length of pin to be inserted, thus affording a firmer hold. Of course both require to be brushed over with two coats of size before papering. The substance above alluded to is of the "corticine" rather than of the "linoleum" variety of the article.—H. G. Knaggs; Folkestone, May 8th, 1894.

The Cyanide Bottle.—The description of the Parisian cyanide bottle on page 177 is very interesting, as it states that a piece is scooped out of the stopper about the size of a florin, and a hole is made through that scoop of the circumference of a threepenny-piece. I feel very interested to understand how a hole the size of a threepenny-piece is made *through* a scoop the size of a florin! It reminds me of the description given in 'Farm Insects,' p. 143, by John Curtis, of *Anthomyia radicum*, in which "the thorax is black, with three darker stripes"! I believe I know what Curtis *meant*, and I believe I understand the *improved* cyanide bottle, but the method of describing is curious in both cases. — G. H. Verrall; Sussex Lodge, Newmarket, April 30th, 1894.

Patent Postal-box without Packing.—In the May number of the 'Entomologist's Monthly Magazine' Dr. H. Guard Knaggs, who has already done so much for the practical as well as for the systematic phase of entomology, has described a new and very secure packing arrangement for the transmission by post of entomological specimens. By an ingenious arrangement of elastic bands, the box containing specimens is suspended in the interior of a larger and stronger one, and in this way the use of cotton wool, tow, or other kinds of packing material is dispensed with. The inventor has most kindly sent me one of these boxes, in which was suspended a seidlitz-powder box containing two butterflies. The package was despatched from Folkestone by parcel post, and the insects arrived in perfect order.—Richard South.

CAPTURES AND FIELD REPORTS.

Asemum striatum, *L.*, in Hampshire.—I was surprised to find a fresh specimen of this insect on turning over a chip of a recently-felled Scotch fir, in Lord's Wood, near here, on May 10th. I do not think it has been recorded in England before, and not, so far as I am aware, excepting from Scotland, in the British Isles; but from its distribution in Europe (Gyllenhal giving it for Switzerland; Redtenbacher, Austria; Mulsant, France), it seems remarkable it should not occur more commonly.—H. S. Gorham; Shirley Warren, May 16th.

Spring Lepidoptera at Tonbridge.—*Pieris brassicæ* (?) seen in the distance, March 27th. *P. rapæ*, a male caught on the same day. *Gonopteryx rhamni*, males seen on March 25th, April 8th and 11th, all apparently fresh; why does this butterfly keep its freshness through the winter so much better than others? *Vanessa urticæ*, one seen on the wing by V. H. Jackson on January 15th; on March 14th I saw another, and several appeared on Easter Day. *Pararge megæra*: of this I found a larva on March 11th; it pupated on April 3rd. *Dasychira pudibunda* was bred by J. E. Hailstone on January 31st. *Brephos parthenias*, not noticed till March 31st. *Phigalia pedaria*, one found on palings, February 24th. *Hybernia leucophæria* and *H. marginaria* were common on fences throughout February. *Anisopteryx æscularia*, March 2nd. *Anticlea badiata*, April 1st. On April 11th I heard several cuckoos; on the 12th I saw a swallow and *Lycæna argiolus*. On April 13th I went to Salcombe, South Devon; a female *Pararge megæra* was taken on the 14th, and several *P. egeria* appeared on the 16th. On the 17th I came across another collector who had just taken *Pieris napi*, *Euchloë cardamines*, and *Argynnis euphrosyne*. *Polyommatus phlæas* was seen on April 19th, and *Thecla rubi* taken on April 25th. A female *Dicranura vinula* emerged on April 28th, and a larva of *Arctia villica* pupated on April 29th. *Vanessa cardui* was seen on Bolt Tail on April 30th. A larva of *Arctia caia* was found at Salcombe on gorse, where it had presumably been feeding on the young shoots; a larva of *Bombyx quercus* was found crawling over the same plant. Larvæ of *B. trifolii* were extremely common at Starehole Bottom and on Bolt Head; they seem very general feeders; there was no clover of any sort in the locality where they occurred, but several were found eating different grasses; one was seen to nibble bracken, and others were found, though not actually feeding, on heather, bramble, and violet; one was found eating gorse blossom, which had apparently been its food for some time, as it ejected several pieces of yellowish-brown frass. These larvæ are very shy, and on one's approach, which they perceive very easily, they curl up, often writhing to and fro, remaining thus for a considerable time; several were found sitting on rocks, but by far the greater number were stretched out on dead bracken. In confinement they eat various kinds of clover.—D. P. Turner; 14, Havelock Road, Tonbridge.

Spring Captures at Folkestone.—The following notes of rather early appearances may be of interest:—April 1st, *Selenia illunaria*, *Lobophora polycommata*, *Anticlea badiata;* 8th, *Hemerophila abruptaria*, *Phibalapteryx vitalbata* (I believe the time usually given for the appearance of this species is June and July), *Rumia cratægata;* 9th, *Cidaria suffumata;* 10th, *Ematurga atomaria;* 15th, *Phytometra ænea*, *Herbula cespitalis*, *Epichnopteryx pulla;* 18th, *Thecla rubi*, *Lycæna argiolus*, *Nisoniades tages*.—Stuart G. Hills; Folkestone, April 18th, 1894.

SOCIETIES.

Entomological Society of London.—*March 28th*, 1894.—Henry John Elwes, Esq., F.L.S., President, in the chair. Mr. Percy H. Grimshaw, of 58, Coniston Road, Edinburgh, was elected a Fellow of the Society. Mr. McLachlan announced the sudden death, on the 23rd inst., of Mr. J. Jenner Weir, who joined the Society in 1845, and had been one of its most regular attendants. He also commented on the scientific attainments of the deceased, and his social qualities. Mr. Goss and Mr. Merrifield also spoke of their long friendship with the deceased, and of the respect and esteem which they entertained for his varied knowledge and amiability of disposition. Mr. W. Borrer, jun., exhibited a wasp's nest which had been built in such a way as to conceal the entrance thereto and to protect the whole nest from observation. He believed the nest to be that of *Vespa vulgaris* (*cf.* Proc. Ent. Soc. London, 1892, pp. xx and xxi). Mr. McLachlan and Mr. Blandford made some remarks on the subject. Mr. G. F. Hampson exhibited a specimen of *Gaudaritis flavata*, Moore, from the Khási Hills, and called attention to the existence in the males of this species, in the closely allied British species *Cidaria dotata*, Linn., and also in two Japanese species (*C. agnes*, Butl., and an undescribed species), of an organ on the under side of the fore wing, which he suggested might be for stridulation; this organ consisting of a small scar of hyaline membrane situated just below the middle of vein 2, which is much curved: this scar is fringed with long hair, and has running down its middle a row of sharp spines situated on the aborted remains of vein 1, and which is curved up close to vein 2; the spines would naturally rub against part of the costa of the hind wing, but no spines or unusual roughening seems to exist on that or on any of the veins on the upper side of hind wing against which they could strike; below the scar is situated a large shallow fovea or pit in the membrane, slightly developed in *dotata* and *flavata*, but much more prominently in the two Japanese species, and, should the organ prove to be made for stridulation, would probably act as a sounding-board. Mr. Hampson said that in the Japanese species *C. fixseni* of Brem., exceedingly closely allied to *flavata*, the males have no trace of this organ; and he hoped that entomologists who have an opportunity of observing *dotata* in life would make some experiments on living specimens during the ensuing summer; probably confining males and females together would lead to some results. The President, Prof. E. B. Poulton, Lord Walsingham, and Mr. Hampson took part in the discussion which ensued. The Rev. T. A. Marshall communicated a paper entitled "A Monograph of the British Braconidæ, Part V." Mons. Louis Péringuey communicated a paper entitled "Descriptions of new Cicindelidæ from Mashunaland." Prof. Poulton gave an account of his recent tour in the United States, and commented on the entomological and other collections contained in the American museums. Lord Walsingham, Mr. Hampson, and the President also made some remarks on the subject.

April 11*th*.—H. J. Elwes, Esq., F.L.S., President, in the chair. Mr. F. W. Jones, of 63, Carlton Hill, St. John's Wood, N.W., and Dr. William Steer Riding, B.A., M.D., of Buckerell, Honiton, Devon, were elected Fellows of the Society. The Hon. Walter Rothschild exhibited male and female specimens of *Ornithoptera paradisea*, Stdgr., from Finisterre Mountains, New Guinea; *O. trojana*, Stdgr., from Palawan; *O. andromache*, Stdgr., from Kina Balu, Borneo; *Œnetus mirabilis*, Rothsch., from Cedar Bay, Queensland; and a few other splendid species from the Upper Amazons. The President, Mr. J. J. Walker, Mr. Osbert Salvin, Lord Walsingham, Col. Lang, R.E., Mr. Champion, and Mr. Hampson made remarks on the geographical distribution of some of the species and the elevation at which they were taken. Mr. H. Goss exhibited, for Mr. G. A. J. Rothney, several specimens of a species of Hemiptera (*Serinetha augur*, Fab.), and of a species of Lepidoptera (*Phauda flammans*, Walk.), the latter of which closely resembled and mimicked the former. He said that Mr. Rothney had found both species abundantly on the roots and trunks of trees in Mysore, in November last, in company with ants (several species of *Camponotus* and *Cremastogaster*). The Hemiptera appeared to be distasteful to the ants, as they were never molested by them, and he thought that the species of Lepidoptera was undoubtedly protected from attack by its close imitation of the Hemipteron. Mr. Goss said he was indebted to Mr. C. J. Gahan for determining the species. A discussion followed on the mimicking species, in which the President, Mr. Waterhouse, Mr. J. J. Walker, Colonel Swinhoe, Mr. Hampson, and others took part. Mr. J. W. Tutt exhibited (1) a typical specimen of *Lycæna corydon*, captured in July, 1893; (2) a hybrid male (*L. corydon* and *L. adonis*) taken *in copulâ* with a typical female *L. adonis*, May 20th, 1893; (3) a typical male *L. adonis*, May 20th, 1893; (4) a female *L. adonis*, the pigment failing in one hind wing; (5) a pale var. of *L. corydon*, probably to be referred to var. *apennina* of Zeller, usually taken in Italian mountains, or var. *albicans*, H. S., taken in Andalusia. Mr. Tutt remarked that, of the first, Staudinger (Cat. p. 12) says "pallidior," of the latter "albicans." He also remarked that the hybrid retains the external features of the species *corydon*, but has taken on to a great extent the coloration of *L. adonis*. It was captured *in copulâ* with a female *L. adonis*, at a time when *L. adonis* was very abundant, and some weeks before *L. corydon* occurred (vide Ent. Record, iv. p. 230). The question having been raised by the President as to the number of meetings of the Society which it was desirable to hold during the year, and the most convenient dates for such meetings, a long discussion on the subject ensued, in which Mr. Waterhouse, Mr. Salvin, the Hon. Walter Rothschild, the Rev. T. Wood, Mr. S. Stevens, the Rev. J. S. St. John, and others took part.

May 2nd.—H. J. Elwes, Esq., F.L.S., President, in the chair. Mr. S. Stevens exhibited a specimen of *Argynnis aglaia* var. *charlotta*, taken by the late Rev. James Watson in the New Forest in 1870. Mr. J. A. Clark exhibited a curious variety of *Chelonia caja*, having an extraordinary wedge-shaped marking extending from the outer margin to the base of the left hind wing, and also, on the same wing, a small spot which was brown and white in colour, and had the appearance of having been taken from the fore wing and inserted in the hind wing. The specimen was said to have been taken at Abbotts Wood, Sussex, in July, 1892. Prof. E. B. Poulton exhibited living specimens of the larvæ of *Gastropacha quercifolia*, surrounded respectively during the early stages of growth by black twigs and lichen-coloured twigs, the food being the same in both cases. All the larvæ were shown upon a white paper background, but examples of the surrounding twigs which produced the change of colour were shown beside each batch. Mr. Merrifield made some remarks on the subject. Mr. E. Meyrick communicated a paper entitled "On *Pyralidina* from the Malay Archipelago." Mr. C. J. Gahan read a paper entitled "A Supplemental List of the Longicorn Coleoptera obtained by Mr. J. J. Walker, R.N., during the voyage of H.M.S. 'Penguin.'"—H. Goss & W. W. FOWLER, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 22nd*, 1894.—E. Step, Esq., President, in the chair. The Rev. J. E. Tarbat, The Common, Weybridge, was elected a member. Mr. South exhibited a long bred series of *Tæniocampa gothica*, L., including many var. *gothicina*, which he had received from Mr. Rose, of Barnsley; all the specimens were large and of a deep red shade; also heads of *Arundo phragmites*, L., from Hampshire, which were infested by a large dipterous larva. Mr. Turner, a long series of *Hybernia leucophæaria*, Schiff., taken this year, including a considerable number of melanic forms. Mr. Adkin, a series of the same species from the New Forest, the common form among them being the white-banded one. Mr. Auld, a very large recently-bred female specimen of *Ocneria dispar*, L. Mr. Sauzé, a locust (*Ædipoda tartarica*), captured at Brixton among vegetables imported from Italy. Mr. Edwards, a number of reptiles and other zoological specimens, which he had just received from Penang. Several members noted that *Tæniocampa munda*, Esp., *Asphalia flavicornis*, L., *Diurnea fagella*, L., and *Semioscopus avellanella*, Hb., were out.

April 12th.—The President in the chair. The President referred to the great loss the Society had sustained by the death of Mr. J. Jenner Weir, who had always taken such an active interest in its meetings, and a resolution was unanimously adopted that a letter of condolence and sympathy should be sent to Mrs. Weir. Mr. Carpenter exhibited long series of *Hybernia leucophæaria*, Schiff., from Coombe Wood, West Wickham, and the New Forest, showing the typical forms in each place; also ova of *Trachea piniperda*, Panz. Mr. Adkin, for Mr. Billups, the following rare Diptera: *Meigenia majuscula*, from Dulwich, new to Britain; *Sciomyza rufiventris*, from Ireland; *Degeeria pulchella*, bred from *Peronea maccana* by Mr. Adkin; *Urellia eluta*, from Lewisham; and an unknown species of the genus *Phorbia;* also galls of

Dryophanta divisa and their maker, with *Synergus albipes*, one of its inquilines, and five parasites, viz., *Mesopolobus fasciiventris*, *Syntomaspis caudatus*, *Eupelmus urozonus*, *Decatoma biguttata*, and a Chalcid. Mr. Adkin, a drawer showing series of the genus *Noctua* from various localities, especially *N. glareosa*, Esp., and *N. augur*, Fb.; also on behalf of Miss E. Adkin, a bloom of *Tulipa sylvestris*, from an old chalk-pit in Suffolk. Mr. Moore and Mr. Perks, wood which had been destroyed by Coleoptera. Mr. C. A. Briggs, a number of very striking varieties of *Abraxas grossulariata*, L., similar to those figured in Newman and 'The Young Naturalist,' vol. i. Mr. Jäger, a living *Biston hirtaria*, Clerk., stating that he had met with a considerable number of cripples, all malformed on the right side. Mr. Step, a specimen of the fungus *Morchella æsculenta*, L., received from Wootton-under-Edge. A communication was read from Mr. Adye on the early season in the New Forest, Messrs. Step, Adkin, Carpenter, and others taking part in the discussion which followed. The President gave an interesting account of a curious habit of some ducks in killing toads during the breeding season by dexterously slitting their abdomens.

April 26*th*.—The President in the chair. The Rev. M. Corden Jones and Mr. Francis Fell were elected members. Mr. Dennis exhibited a bred variety of *Pararge egeria*, L., in which all the light markings were much extended. Mr. Routledge, a series of *Miselia oxyacanthæ*, L., taken by Mr. Beaumont. Mr. Auld, a series of *Tæniocampa munda*, Esp., with several examples of var. *immaculata*, Stgr., taken at West Wickham; also a series of *T. populeti*, Fb., taken at Westerham. Mr. Enock gave a discourse, "Notes on Common Insects," illustrating it by about fifty slides shown with the oxyhydrogen lantern. He dealt largely with common pests and their parasites, such as the sycamore aphis, with its numerous enemies; the currant mite; the sawfly of the willow, with the insects which attack its larva; the fly whose larva mines the Marguerite plant; the parasites of the Hessian-fly; and lastly, beautiful examples of the minute fairy-flies, of which he stated he possessed at least 150 species. He laid considerable stress upon the economic side of the subject, and strongly advocated following the example set by the United States government in having an entomological section attached to the Agricultural Department. The information given was the result of original observations, and unobtainable in any book. The admirable manner in which the interesting and peculiar life-histories of these minute creatures were portrayed upon the screen and described, excited the greatest admiration among the large number of members and friends present. After a few remarks from the chairman on the kindness shown by Mr. Enock in coming to both entertain and instruct us, Mr. Barrett proposed and Mr. Auld seconded a hearty vote of thanks to Mr. Enock, which was unanimously passed. In reply, Mr. Enock said that at present he saw no chance of either the farmers or the government taking up the matter of Economic Entomology, and he considered both were culpably ignorant.

May 10*th*.—The President in the chair. Mr. H. B. Laurence, of Anerley, was elected a member. Mr. South exhibited a bred series of *Boarmia cinctaria*, Schiff., with the parent female from Glengariff, Ireland; like the female they were pale, but not so pale as those captured by Mr. Kane some time ago. Also the new postal-box invented by Dr. Knaggs; a trial was made, insects were placed in it, and after rough usage it was opened, and the specimens were found quite intact, showing it to be a very successful device. Mr. Barrett, on behalf of Mr. Sidney Webb, the pick of his valuable and extraordinary varieties of the "Tigers," and no doubt unequalled in the world, viz.: *Arctia villica*, L., varying from almost spotless to nearly black; *A. caia*, L., spotless, brown marbled, pale blotched, pink shaded, black suffused, and half one colour, half another, &c.; *Nemeophila plantaginis*, L., red and pale; *Callimorpha dominula*, L., yellow, white spotted, pink, and dusky. Mr. Barrett made some remarks on the normal and abnormal varieties exhibited. Mr. Frohawk, a specimen of *Vanessa urticæ*, L., having the marginal blue spots exaggerated, and extending into the black border about twice the usual distance. Mr. Adkin, a case containing series of most of the genus *Tæniocampa*, showing extreme variation, all from the New Forest. Mr. Williams, a bred specimen of *Pieris napi*, L., in which only the hind wings had developed. Mr. Turner, specimens of *Sirex gigas* from Box Hill and Chichester, several species of Neuroptera, and a specimen of *Bombylius major* from Box Hill.—Hy. J. Turner (*Hon. Report. Sec.*).

Birmingham Entomological Society.—*March 19th*, 1894.—Mr. R. C. Bradley in the chair. Exhibits:—By Mr. A. H. Martineau, a few insects from Sierra Leone; also a small collection of Lepidoptera made in Lundy Isle by Mr. R. W. Chase, which included *Satyrus semele*, *Vanessa atalanta*, *V. polychloros*, *V. urticæ*, *Bombyx rubi*, *Zygæna trifolii*, *Z. filipendulæ*, and others. Mr. Bradley remarked that in several cases the forms were decidedly under the average in size. By Mr. Bradley and C. J. Wainwright, each showed boxes containing their Tachinidæ. By Mr. P. W. Abbot, single specimens of *Leucania obsoleta* and *Senta maritima* from near Ely.

April 26th.—Mr. G. H. Kenrick, President, in the chair. Mrs. Petley, Pedmore Lodge, near Stourbridge; Mrs. P. W. Abbott and Miss Titley, Four Oaks, were elected members of the Society. Exhibits:—By Mr. Colbran J. Wainwright, a collection of Diptera made at Wyre Forest at Easter; amongst others there was a large series of an *Echinomyia*, perhaps *ursina*, which had been extremely abundant throughout the forest, more particularly on the sallows; there were also short series of *Chilosia grossa* and *flavicornis*, and larger ones of *Syrphus lasiophthalmus* and *Melanostoma quadrimaculatum*, all taken on the sallow bloom. He remarked on the bee-like appearance of the *Echinomyia* and the two species of *Chilosia;* the latter resembled *Andrena fulva* so closely that it was with difficulty that he recognised them when settled on the bloom. By Mr. R. C. Bradley, a long series of the above *Echinomyia*, taken at the same time and place; also two specimens of *Bombus latreillellus* from Sutton. By Mr. W. Harrison, living larvæ of *Melitæa artemis*, of which he had taken a considerable number on the devil's-bit scabious at Arley; also *Stauropus fagi*, bred from larvæ taken at Wyre Forest last year; and *Neuria saponariæ* from Wicken Fen. Mr. G. H. Kenrick read some "Notes on the Migration of Insects," in which he called attention to such facts as were known about migration, and dealt with various possible explanations, suggesting that in some cases at least it might be possible that the migration was similar to that in birds; that with *Vanessa cardui*, for example, which appears during the winter months in the North of Africa, Egypt, &c., it was possible that it migrated northwards to moister climates for the summer brood, returning south again for the winter brood; and he asked for information and evidence as to the actual hybernation of this and other migratory species in our own country. A discussion ensued, in which Messrs. R. C. Bradley, G. T. Bethune-Baker, P. W. Abbott, W. Harrison, G. H. Kenrick, and C. J. Wainwright, took part.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*April 9th.*—Last meeting of the winter session, the President in the chair. The following papers were read:—"Lepidoptera of Prescot," by the Rev. R. Freeman; "A Note on Aculeate Hymenoptera and Diurnal Lepidoptera during March, 1894," by Mr. Willoughby Gardner, F.R.G.S.; and "Ammophila lutaria," by Mr. C. E. Stott. All the papers were illustrated by specimens. Reports of the additions to the lists of the insect fauna of Lancashire and Cheshire for the years 1891–2–3 were read as follows:—Coleoptera and Hemiptera-Heteroptera, by Mr. W. E. Sharp; Hymenoptera, by Mr. Willoughby Gardner; and Lepidoptera, by Messrs. Capper and Pierce. These reports showed that many important additions had been made to the lists, and that steady work was being done in the neglected orders. Mr. Jones exhibited a number of *Tæniocampa* taken from sallows at Llangollen; Mr. Crabtree, *Callimorpha hera* and light varieties of *Zygæna filipendulæ;* Miss Tomlin, of Chester, a number of Hymenoptera from Madras; the Rev. Mr. Freeman, Rhopalocera from N.W. India; and Mr. Sharp, a collection of local Hemiptera-Heteroptera.—F. N. PIERCE, *Hon. Sec.*

HERTS NATURAL HISTORY SOCIETY.—The 181st ordinary meeting, held at Watford, on April 17th, under the presidency of Dr. Arthur Stradling, F.Z.S., was devoted to the purpose of receiving reports from the recorders in various branches of natural science. Mr. A. E. Gibbs, F.L.S., F.E.S., read a paper entitled "Notes on Lepidoptera observed in Hertfordshire during 1893," in the course of which he gave the experience of observers stationed in various parts of the county, and detailed the most interesting captures. A second paper was subsequently read by the same gentleman on "The Wasp Infestation of 1893," in which he showed the great damage done by wasps, and gave some account of the enormous number of nests destroyed, and the means adopted to keep the numbers down. Votes of thanks were accorded to the recorders for the papers they had read.

A NEW SOCIETY.—THE MIDLAND RAILWAY NATURALISTS' SOCIETY has recently been established at Derby. The first monthly meeting was held on Monday, May 7th, at the Midland Railway Institute, the President, Mr. T. Hey, in the chair. It is proposed to form sections to deal with the various branches of Natural History. The majority of the members are especially entomologists. The meetings of the Society will be held on the first Monday in each month.—F. W. G. PAYNE, *Honorary Assist. Secretary.*

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FURTHER NOTES ON CERTAIN VARIETIES OF *SPILOSOMA LUBRICIPEDA*.

By W. H. Tugwell.

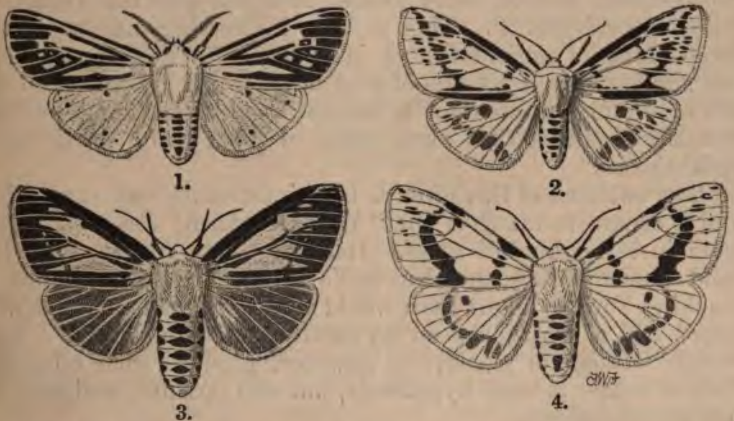

Fig. 1. *S. menthastri* var. *walkeri*, Curt. Fig. 2. *S. lubricipeda* var. *eboraci*, Tugwell. Fig. 3. *S. lubricipeda* var. *zatima*, Cram. (= *radiata*, Haw.). Fig. 4. *S. lubricipeda* var. *fasciata*, Tugwell.

In my former notes on this subject (*ante*, pp. 95-97 and 129-30) I mentioned that I was much interested in a cross brood between a female of my var. *fasciata* (fig. 4) and a male of the var. *radiata* (= *zatima*) (fig. 3) that Mr. Porritt and I had then in pupa; this cross being just the reverse to that effected by Mr. Harrison, who in his first brood in 1891-2 crossed a bred female *radiata* with a strongly-marked northern (*i. e.*, Yorkshire or Lincolnshire) male. It will be recollected that from this pairing in 1891 Mr. Harrison bred a varied brood showing evidences of both parents, and exhibiting the gradations between true *radiata* and the normal form of *lubricipeda*, a fair percentage being *radiata*. By selecting males and females of the latter form, and breeding from them, Mr. Harrison has supplied us with this grand variety of *lubricipeda*. In May, 1893, when I was breeding the form I named *fasciata*, I selected a strongly-banded female, and sent to Mr. Porritt for him to try and cross with *radiata*, the emergence of that form being over with me. Mr. Porritt's *radiata* being a trifle later, he was enabled to obtain the desired crossing, and we each had a portion of the ova. The result now off the setting-boards is most satisfactory and interesting.

A few only of my portion came out as true *radiata*, like its male parent; most of them favoured the female parent; that is to say, had not the black under wings finely pencilled by the yellow nervures of *radiata*, but had instead the broadly-marked note of interrogation-like character so pronounced in the var. *fasciata*. Still, curiously, not one was quite a pure *fasciata*, always having the strongly-developed oblique line of markings from the apical tip to the middle of inner margin very strongly accentuated; in fact, being almost identical with the York City form, *eboraci* (fig. 2). This is very interesting, as out of the large brood of *radiata* I bred in 1893–4 (720 ova, the result of one single pairing) not one of that brood could be mistaken for *eboraci*. But the cross of a female *fasciata* and a male *radiata* virtually produced that form, some of them being particularly striking vars.

The outcome of this cross is both interesting and suggestive. and it occurs to me that the "York City form" *eboraci* resulted from just this kind of cross. Has not a male *radiata* from the sand dunes of Lincolnshire or Yorkshire a greater chance of reaching York by flight than would a heavy female charged with eggs? and a cross between an errant *radiata* male and a local female *lubricipeda* would, we now see, produce such offspring. This of course is mere hypothesis, but still possible, and may we not say probable.

6, Lewisham Road, Greenwich.

[As they may better fix the various forms referred to, figures of vars. *zatima*, Cram. (=*radiata*, Haw.), *eboraci*, and *fasciata*, Tugwell, are given; these, together with others in vol. xxvi. p. 257, furnish a very good idea of the variation of *S. lubricipeda*. *Walkeri*, Curtis, is a variety of *S. menthastri*, but as it is somewhat similar to var. *zatima* of *S. lubricipeda*, and has been confounded with that form, the original figure is here reproduced in black and white (fig. 1).—Ed.]

THE HUNTING-SPIDER OF THE VINE.

By T. D. A. Cockerell,

Entomologist of the New Mexico (U.S.A.) Agricultural Experiment Station.

On April 30th, when investigating the insects of the grape-vine at Las Cruces, New Mexico, I found a beautiful little Attid spider in some numbers. The vine-insects hitherto observed in this vicinity exceed a dozen, of which one in particular, the leaf-hopper (*Typhlocyba*), is decidedly troublesome. Certain beetles were found, which live upon the vines, and undoubtedly destroy some of the injurious species; of these a Coccinellid, *Hippodamia convergens*, Guér., and a Malachiid, *Collops vittatus*, Say, were observed by me to be particularly numerous.

The spider was not actually observed to prey upon the leaf-hoppers, but that it does so cannot be well doubted. I brought away several specimens, and on comparing them with the published descriptions was quite surprised to find that they would fit none, and the genus even was rather uncertain. I wrote out a description, but fearing that I had overlooked some species already published, I forwarded my types to Mr. George W. Peckham for his opinion. The reply soon came that the creature represented not only a new species, but a new genus! Mr. Peckham wrote:—"It is certainly a new species, bearing a general relation to *Icius* (*Dendryphantes*) *elegans*, but quite distinct. I have a still closer relation from Kansas, but the latter is larger, with different colours. I know of no genus into which it will properly fit, and suggest that you make a new genus to take in your species and the one from Kansas. This genus would be related to *Icius*, and also to *Eris*."

At the present time, at all events, I do not care to act on Mr. Peckham's kind suggestion as to the new genus, and will describe the spider under the name I first gave it in MS., *Dendryphantes vitis*. I have found some difficulty in understanding the existing genera of Attidæ, and it would seem a case of the blind trying to lead the blind were I to propose a new one. But Mr. Peckham, on the other hand, is a master of the subject, and should he find time and opportunity himself to describe the new genus, science will gain thereby.

Dendryphantes vitis, n. sp.

Total length, 3½ mm. Length of first pair of legs, 3½ mm.; of second, 2; of third, 2 or slightly less; of fourth, 2½. Leg-formula, 1423. Cephalothorax, breadth, 1¼ mm.; length, 1¾ mm. Abdomen, breadth, 1 mm.; length, 2 mm. Patella and tibia of first leg, 1⅖ mm. Cephalothorax flat, squared in front. Cephalic part shorter than thoracic, but not much shorter. Dorsum of cephalic part brilliant, with rosy scales; of thoracic part dark, with a few pink scales; a creamy patch behind each dorsal (hindmost) eye. Sides of cephalothorax black, the thoracic part with a marginal silvery band. Quadrangle of eyes slightly widest behind; third pair of eyes nearer second than fourth. The four front eyes touching (or almost so); first about twice diameter of second. Under side, including palpi and mandibles, all dark reddish brown. A few brilliantly iridescent metallic scales on under side of abdomen toward the sides. Some white scales on tibia and patella of last three pairs of legs, and conspicuously on inner side of tibia and patella of first pair. Abdomen covered with appressed hairs and scales, shining metallic yellowish silvery, with a greenish tinge. A creamy-white band bordering anterior half. Four small creamy-white marks, *i. e.*, two subdorsal about middle of abdomen, and two larger elongate lateral marks towards the end, representing a broadly interrupted band. First pair of legs with stout femora; coxa and femur brown-black; tibia and first half of tarsus dark red-brown; last half of tarsus orange-brown. Claws of all the legs black. The last three pairs of legs have the coxæ shining somewhat translucent reddish brown; femora brown-black (last pair with femora rather dark brown); tibiæ and first half of tarsi red-brown; last half of tarsi paler. Legs sparingly hirsute with dark hairs. Tibia of fore leg with three black spines on inner side; first joint of tarsus with two larger black spines on inner side. Tibia of fore leg much longer than patella, but not twice as long. The third leg has a somewhat longer tarsus than the second, but the patella and tibia is much shorter than in the second.

From *D. elegans*, Hentz, it may at once be known by the close proximity of the second eyes to the first; whereas in *elegans* they are separated from them by one-half their own diameter. The eyes of the second row are also differently placed.

Las Cruces, New Mexico, U.S.A., May 11th, 1894.

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. de Vismes Kane, M.A., M.R.I.A., F.E.S.

(Continued from p. 126.)

Cymatophora fluctuosa, *Hb.*—Very rare. The Irish specimens which I have seen have the ground colour of a pearly white, and the band dark grey, well marked. Killarney (*B.*) I took one near Cromaglaun Glen, on the Upper Lake. Two near Kenmare (*Miss V.*), Co. Kerry; Rookwood, L. Gill, Co. Sligo (*Russ*), where I also took two.

[*Asphalia diluta* and *flavicornis*. Mr. Birchall gives Killarney as a locality for the former, and states the latter to be common in Ireland. I have never seen Irish specimens of either, and believe the former locality to have been derived from a very unreliable source].

NOCTUÆ.

BRYOPHILIDÆ.

Bryophila muralis, *Forst.*—The type has been taken by the Rev. Joseph Greene, and I think the late Frederick Bond, at Queenstown, and elsewhere in the vicinity of Cork by the late Mr. Sinclair, whose collection I possess. They present very great diversity, and range from specimens belonging to Mr. Bond, which he states (*in litt.*) are greener than any English ones in his possession, to a dingy yellowish grey with strongly-marked design. In Co. Galway a few examples of ordinary character have been captured by Mr. Allen and Mr. Dillon.

Var. *impar*, Warren.—Along with the type, which occurs numerously in the neighbourhood of Cork, Mr. Sinclair took a very long series of extremely varied forms, some of which correspond to the various aberrations named by Mr. Tutt "*flavescens, pallida, obscura*," and others, to *impar*, Warren. The design, which in the type consists of sharply-defined black lines, becomes more and more obsolete in the aberrations, till it is merely represented in *impar* by pale striæ, and in var. *obscura* by dark blotches on a smoky grey ground. When Mr. Warren published his description of the Cambridge variety, under the name of v. *par*, Hb., I showed a selection of my Cork specimens to him, which he acknowledged to belong to that form (Ent. Mo. Mag. xxi. 23). Mr. Bond also identified them at once as "Mr. Warren's *par* or *impar*." The varietal characters quoted and given by Mr. Tutt ('British Noctuæ,' vol. iv.) are all shown by the Cork examples; but last year Mr. Farren allowed me to inspect a fine fresh series taken by him at Cambridge, among which were some more uniformly speckled, with very distinct black scales, and of a steel-grey coloration. I have no Irish examples which correspond with these. It has been urged by some that v. *impar* may be classed as a distinct species (or subspecies, whatever that may mean); but it must be recollected that in Co. Cork a very graduated series can be taken on the same wall with the type, including the form named by Mr. Warren, which grades off into the v. *obscura*. *Impar*, therefore, is only an aberrant form in Cork, though a local variety at Cambridge, only one specimen of the type having been recorded there. I am not in favour of indicating every grade of variation of so unstable an insect by a separate name, unless it is very distinct from the rest, or is strictly localised. I acknowledge, however, that the speckled bluish grey form taken by Mr. Farren, at Cambridge, is a very remarkable one, and well distinguishable from the general run of *impar*. The following description of the

Irish *impar* is quoted from a paper of mine on South of Ireland Lepidoptera, published in the 'Proceedings of the Royal Irish Academy' (vol. iv. p. 113):—"This variety differs from the type by its blurred delineation, the sharp black lines of *Bryophila muralis* being replaced by ill-defined shadings; the black spots on costa being, however, retained as in type. In the lighter specimens the clear ground colour of type is replaced by a faded greenish or yellowish dusty grey, marked with dusky shadings, the black ante-marginal line being replaced by a pale one, having a dark external blotch where it touches the inner margin. The darker examples have a dark olive-grey ground colour, with darker suffused shadings, especially three blotches external to the ante-marginal line, of which *the one resting on the inner margin is always the deepest in tone*. Intermediate between the pallid obsolete form and the melanic one just described is a series differing in depth of ground colour and shading, the blotch above described being always the darkest mark on the wing. All four wings have a slight black line at the base of the cilia. The thorax of this variety also is more or less dusted with minute black specks."

BRYOPHILA PERLA, Fb. — Common and widely distributed. The type is frequent in the South, as well as occurring in Co. Down, at Newcastle (*W.*); Armagh (*J.*); Co. Galway (*Mr. Dillon*); and in Co. Dublin, where, at Howth (*G. V. H.*), has been also taken the ochreous tinted form *flavescens*, Tutt.

BOMBYCOIDÆ.

MOMA ORION, *Esp.*—The Hon. R. E. Dillon sent me one of three specimens of this species, taken at Clonbrock, Co. Galway, and mentioned having also found larvæ, which, however, he failed to rear. Also, on July 19th, 1893, we were at Mote Park, Co. Roscommon, when he saw, but failed to take, an imago. (*Cf.* 'Entomologist,' vol. xxvii. p. 91.)

DEMAS CORYLI, *L.*—Distributed throughout Ireland, but not met with generally in large numbers, except occasionally in the larval stage. The imago varies in the strength of the brown band on the fore wings, which sometimes almost obliterates the stigmatic and waved markings; while in others the band is only slightly represented, and one has been taken at Clonbrock, by the Hon. R. E. Dillon, in which it is obsolete. Co. Donegal, Buncrana, and "common in the woods about L. Swilly" (*C.*); Co. Sligo, Knocknarea (*R.*) and Markree; Co. Roscommon, Hollybrook; Co. Tyrone, common about Favour Royal and Altadiawan; Co. Monaghan, Drumreaske; Co. Cavan, Farnham; Co. Galway, common at Ardrahan (*Miss N.*), and Clonbrock (*R. E. D.*); Co. Wicklow, Powerscourt, and Glendalough; Co. Waterford, generally spread; Co. Kerry, Killarney.

ACRONYCTA TRIDENS, *Schiff.*—I know little of the distribution of this species, as I am unwilling to record reputed captures of the imago. "Dublin and Galway" (*B.*); larvæ at Inishowen and Donegal (*W. E. H.*); Mr. Russ reports it from near Sligo; and at Banagher, King's Co., I took an imago probably of this species. It must be rare in Ireland, as I have never beaten the larvæ.

ACRONYCTA PSI, *L.*—Everywhere abundant in the pale typical form. I have seen no suffused Irish specimens.

ACRONYCTA LEPORINA, *L.*—I know of no captures of this insect in the northern half of Ireland. I have taken it at Howth, Co. Dublin, and Mr. Fitzgibbon the larvæ; Mr. Birchall records it from Powerscourt, Co. Wicklow; and Co. Kerry, where I have met with it at Killarney, and Miss Vernon near Kenmare. One at Waterford; Co. Galway, Clonbrock, abundant (*R. E. D.*); and one at Dalyston, near Loughrea. All Irish examples that I have seen are the typical form with white ground, except one I took at Killarney, which has the outer margin suffused, and is represented by the third figure in Newman's 'British Moths,' but with paler shadings.

ACRONYCTA ACERIS, *L.*—Co. Galway, Claring Bridge (*B.*), and one near Ahascragh (*R. E. D.*). Mr. Donovan sent me some pupæ from Glandore, Co. Cork, which he attributed to this species, but they did not produce imagines.

ACRONYCTA MEGACEPHALA, Fb.—Decidedly scarce in Ireland. Rare in Co. Down (*W.*); Co. Monaghan, one near Favour Royal; Co. Wicklow and Co. Dublin, one (*Greene*), and several at Howth (*G. V. H.*); Co. Galway, Clonbrock, two (*R. E. D.*); Co. Westmeath, Killynon, one (*Miss R.*).

ACRONYCTA ALNI, *L.*—"Powerscourt, Co. Wicklow, one" (*B.*); and there is a tradition that one was taken on the walls of Trinity College, Dublin, many years ago, by Mr. Holt; but I failed to find the specimen in his collection.

ACRONYCTA LIGUSTRI, *Fb.*—The Irish head-quarters of this insect seems to be the Co. Galway, where it was taken in Connemara by the Hon. Miss Lawless, Claring Bridge (*B.*), Clonbrock, in some numbers (*R. E. D.*), and at Merlin Park by myself.

ACRONYCTA RUMICIS, *L.*—Universally distributed throughout Ireland. The var. *salicis*, Curt., also occurs in widely separated localities, together with the type, which graduates from a very pale form almost as ashy grey as *menyanthidis*, with most of the typical dark markings obsolete, to the dark brown *salicis*, two specimens of which I have from Glandore, Co. Cork, in which the only pale marks are a small lunular anal spot, a trace of a pale antemarginal series of dots, and a pale patch at the base of fore wings. In some instances the dark edgings to the stigmata are scarcely to be distinguished, being almost obliterated by the dark ground colour. Also I have one brown specimen with black markings, without any white or grey spots. The distribution of the var. *salicis* does not appear dependent on climate. I have fine specimens from Ulster, near Favour Royal, on the borders of the Counties Tyrone and Monaghan; in the midland County of Westmeath, at Killynon (*Miss R.*); and in the South of Cork and Kerry, at Glandore and Ardtully respectively; and at Wexford. My palest grey specimen of the type referred to above, I took at Drumreaske, Co. Monaghan; at Newcastle, Co. Down, Mr. Watts reports very pale forms, which also I have noted in the West of King's Co., in Tyrone, and in Kerry.

ACRONYCTA MENYANTHIDIS, *Vw.* — Apparently rare and very local in Ireland. Those which I have seen seem to belong to the var. *scotica* of Tutt, showing a very white central area, with the outer marginal band, the suffusion about the reniform stigma, and basal half of the inner margin, often very strongly shaded with black. I have seen Aberdeen specimens very similar in the sharp contrast of black and white. Letterkenny, Co. Donegal, Rev. R. Harvey (*B.*); Co. Sligo, at L. Gill and Markree; Killynon, Co. Westmeath; two larvæ on *Myrica gale*, near Galway (*A.*).

ACRONYCTA EUPHORBIÆ var. *montivaga*, Gn.—Rare and local in Ireland. I have two from Markree and L. Gill, Co. Sligo, which are identical in colour and traits with my types of *R. montivaga* from the Continent. And Dr. Staudinger identified British specimens sent him as belonging to this variety rather than to *myricæ*, Gn. (Entom. vol. xi. p. 41). Mr. Tutt considers that Rannoch examples belong to the latter. Clonbrock, Co. Galway (*R. E. D.*). I have specimens taken near Caragh L., Co. Kerry, by Dr. W. E. Battersby. I also found two pupæ in cocoons interwoven with lichen on a rock at Galley Head, Co. Cork. All these localities are at a low elevation above the sea, and the climate of Cork and Kerry is very equable and mild; so that if the divergence from the type originated from alpine conditions, it is interesting to find it persistent, in spite of altered climatal environment, since the first arrival of the species in Ireland, presumably at the close of the glacial epoch.

DILOBA CÆRULEOCEPHALA, *L.* — "Generally distributed, but apparently not abundant" (*B.*). I know but the following localities: — Magilligan, ab. Co. Derry (*C.*); Enniskillen (*S.*); Cromlyn, Westmeath (*Mrs. B.*); Ardrahan (*Miss N.*); also imago not scarce, and larvæ on whitethorn, near Ahascragh (*R. E. D.*), Co. Galway; near Cork (*H. C. Sandford*).

(To be continued.)

NOTES ON THE SYNONYMY OF NOCTUID MOTHS.

By Arthur G. Butler, Ph.D., F.L.S., &c.

(Continued from p. 193.)

Platyja, *Hübner*.

Cotuza and *Ginæa*, Walk.

Platyja umminia.

♀ *Phalæna umminia*, Cramer, Pap. Exot. iii. p. 137, pl. cclxvii. fig. F.
Sympis subunita, Guenée, Noct. iii. p. 344, n. 1810 (1852).
♂ *Cotuza drepanoides*, Walker, Lep. Het. xv. p. 1552, n. 1 (1858).
♀ *Ginæa removens*, Walker, *l. c.*, p. 1638, n. 1 (1858).

Java, Sumatra, Borneo, Penang, Moulmein, Hong-Kong, N. India, and Cape York. In Coll. B. M.

CALPIDÆ.

The proper position for this family is, I have no doubt, between the so-called Ophideridæ (though the genus *Ophideres* falls as a synonym of *Othreis*, Hübn.), which will have to be called Othreidæ, and the Plusiidæ.

Gonodonta, *Hübner*.

Gonodonta incurva.

Phalæna incurva, Sepp. Surin. Vlind. ii. p. 201, pl. 89 (? 1850).
Gonodonta teretimacula, Guenée, Noct. ii. p. 367, n. 1211 (1852).
Gonodonta temperata, Walker, Lep. Het. xii. p. 957, n. 26 (1857).
Gonodonta velata, Walker, *l. c.*, n. 27 (1857).

Venezuela, Guadeloupe, Ega. In Coll. B. M.

A slightly variable and widely distributed species.

PLUSIIDÆ.

Plusia signata.

Noctua signata, Fabricius, Ent. Syst. iii. 2, p. 81, n. 234 (1793).
Plusia diminuta, Walker, Lep. Het. Suppl. iii. p. 837 (1865).

Java, Fiji, and Sierra Leone. In Coll. B. M.

Although there is no ?-shaped marking on the primaries, as mentioned by Fabricius, but two markings, *o v*, as in *P. nigriluna* and other allied forms, it appears to be the only species in which the three black sub-basal spots mentioned by the describer of *P. signata* are present; as a matter of fact, whenever the note of interrogation is present in the species of *Plusia* it is without its terminal dot and lies on its back, being followed by a spot of silver or gold thus— ⌣.: for a trivial name, the "hook-and-eye moth" would be far more appropriate to this character than any other.

Plusia limbirena.

Plusia limbirena, Guenée, Noct. ii. p. 350, n. 1179 (1852).
Plusia confusa, Moore, Descr. Ind. Lep. Atk. ii. p. 149 (1882).

Delagoa Bay, S. Africa, Madagascar, St. Helena, Aden, Nilgiris. In Coll. B. M.

There is absolutely no difference between African and Indian examples of this species.

Plusia eriosoma.

Plusia eriosoma, Doubleday, Dieff. New Zeal. i. p. 285, n. 114 (1843).
Plusia verticillata, Guenée, Noct. ii. p. 344, n. 1168 (1852).
Plusia rogationis, Guenée, *l. c.*, n. 1169 (1852).
Plusia includens, Walker, Lep. Het. xii. p. 914, n. 59 (1857).
Plusia hamifera, Walker, *l. c.*, p. 917, n. 64 (1857).
Plusia acuta, Walker, *l. c.*, p. 922, n. 75 (1857).
Plusia adjuncta, Walker, *l. c.*, Suppl. iii. p. 840 (1865).
Plusia dyaus, Grote (see Check-List, p. 34, n. 856).
Plusia chrysosema, Zeller in coll. (ined. ?).

Java, Borneo, Ceylon, Japan, Formosa, China, Nilgiris, Dhamsala, Karachi, Silhet, Moulmein, Philippines, Port Darwin, Sidney, New Zealand, Tonga, Eimeo Isl., Oahu, Hawaii, United States, Caraccas, Venezuela, St. Domingo, Santarem, Sao Paulo, Rio Janeiro, Wadelai, Congo, Port Natal.

Although slightly variable in tint and the prominence of golden cupreous gloss on the wings, the species really shows such trivial modifications that its synonymy is astonishing.

Plusia ou.

Plusia ou, Guenée, Noct. ii. p. 348, n. 1176 (1852).
Plusia fratella, Grote (see Check-List, p. 34, n. 864).

United States. In Coll. B. M.

Grote's type is only a dwarfed specimen of the male, and differs hardly at all from the distorted example selected by Guenée as the type of his *P. ou*.

Plusia californica.

Plusia californica, Speyer (see Grote's Check-List, p. 34, n. 862).

The bulk of the species so labelled in the Museum are from California; two from Vancouver, and one from Hudson's Bay: these are identical with Grote's *P. pseudogamma*.

The species labelled by Grote as *P. gamma* var. *californica*, Speyer, differs in no respect from the European species: his example is from Vancouver, and one in the Museum is from the Rocky Mountains.

Surely the Californian form must be the one named by Speyer; in which case Grote's insect is synonymous, but I very much doubt whether the distinctness of the latter from *P. gamma* can be maintained.

Plusia jessica.

Plusia jessica, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. i. p. 201 (1878) ; Ill. Typ. Lep. Hist. iii. p. 22, pl. xlvi. fig. 6 (1879).
Plusia serena, Butler, *l. c.* vol. iv. p. 368, n. 51 (1879).
Yokohama, Tokio. Types in Coll. B. M.

Plusia mandarina.

Plusia mandarina, Freyer, Neuere Beitrage, v. p. 164, n. 869, pl. 479, fig. 4 (1846).
Plusia typinota, Butler, Ann. & Mag. Nat. Hist. ser. 5, vol. i. p. 201 (1878) ; Ill. Typ. Lep. Het. ii. p. 34, pl. xxxi. fig. 10 (1878).
Ural (*Freyer*). — ? (Zell. coll.). Japan in Coll. B. M.

Freyer's figure is so much more like *P. gutta* than the species recognized as *P. mandarina* by European Lepidopterists, that I am, even now, not satisfied that their identification of his species is correct : with the colour-blindness common to many entomologists, the silver markings on the primaries are rendered as golden ; but, apart from this, the shorter wings and the prominence of the dark central belt are far more characteristic of *P. gutta* than of the *P. gamma* group : at the same time, if the markings of Freyer's type really are golden, the species can neither be *P. typinota* nor *P. gutta*. For the present I accept the identification, on the chance that Freyer's figure may be exceptionally bad. On the other hand, *P. macrogamma* is certainly the same as *P. typinota*, whether Zeller's specimens of *P. mandarina* are rightly or wrongly named.

Plusia circumflexa.

Phalæna circumflexa, Linneus, Syst. Nat. xii. p. 841.
Plusia patefacta, Walker, Lep. Het. xii. p. 924, n. 78 (1857).
Europe, S. Africa, Teneriffe, Nilgiris. In Coll. B. M.

Plusia flagellum.

Plusia flagellum, Walker, Lep. Het. xii. p. 909, n. 49 (1857).
Plusia monodon, Grote (see Check-List, p. 34, n. 860).
United States. In Coll. B. M.

Plusia oxygramma.

Autographia oxygramma, Hübner, Geyer Zutr. Exot Schmett. p. 37, figs. 769, 770.
Abrostola transfixa, Walker, Lep. Het. xii. p. 884, n. 8 (1857).

Natal, Ceylon, Java, Japan, China, Nilgiris, Dhamsala, Moreton Bay, and Fiji. In Coll. B. M.

Hübner's locality, "Georgia," probably means Georgia in Asia.

Plusia indigna.

Plusia indigna, Walker, Lep. Het. xii. p. 909, n. 50 (1857).
Plusia parallela, Walker, *l. c.*, p. 918, n. 66 (1857).
North and South America. Types in Coll. B.M.

Plusia anargyra.

Plusia anargyra, Guenée, Noct. ii. p. 351, n. 1183 (1852).
Plusia spoliata, Walker, Lep. Het. xii. p. 923, n. 76 (1857).
Madagascar, Congo, and Nilgiris. In Coll. B. M.

LOPHOPTERIDÆ.

PATÆTA, *Walk.*

Patæta carbo.

Phlegetonia carbo, Guenée, Noct. 2, p. 302, n. 1108 (1852).
Patæta conspicienda, Walker, Lep. Het. xv. p. 1748, n. 1 (1858).
Australia. In Coll. B. M.

STICTOPTERA, *Guen.*

Stictoptera diaphana.

Stictoptera diaphana, Guenée, Noct. 2, p. 53, n. 1386 (1852).
S. subaurata, Walker, Lep. Het. xiii. p. 1132, n. 5 (1857).
S. phryganoides, Walker, *l. c.*, xv. p. 1812 (1858).
Nagara? steirialis, Walker, *l. c.*, Suppl. 4, p. 1379 (1865).
Amazons. In Coll. B. M.

It is quite clear that Walker never attempted to identify the Lophopteridæ described by M. Guenée, all of which are quite easy to recognize.

Stictoptera vitrea.

Stictoptera vitrea, Guenée, Noct. 3, p. 53, n. 1385 (1852).
Nagara phryganealis, Walker, Lep. Het. Suppl. 4, p. 1378 (1865).
Jamaica, Rio Janeiro, and Pará. In Coll. B. M.

Stictoptera trajiciens.

Steiria trajiciens, Walker, Lep. Het. xiii. p. 1137, n. 3 (1857).
S. æquilinea, Walker, *l. c.*, Suppl. 3, p. 922 (1865).
Ceylon and Saráwak. Type in Coll. B. M.

Colonel Swinhoe says that Walker's identification of *S. æquilinea* (Journ. Linn. Soc. vii. p. 174, from the Saunders' collection) is incorrect. The type is at Oxford, and is (he says) distinct from *S. trajiciens*.

Stictoptera divaricata, Grote, belongs to the Hadenidæ; its neurational and other characters are quite unlike those of true *Stictoptera*. It is a species of *Sasunaga*, Moore, which is *Magusa*, Walk., and is Felder's *M. dissidens*.* Walker's *Xylina orbifera* is a variety of his *Magusa strigifera*.

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* *Laphygma angustipennis*, Moeschler, from Jamaica, is the same species.

Lophoptera, *Guen.*

Lophoptera squammigera.

Lophoptera squammigera, Guenée, Noct. 3, p. 55, n. 1388 (1852).

L. vittigera, Walker, Lep. Het. Suppl. 3, p. 920 (1865).

Australia. In Coll. B. M.

The genus *Lophoptera* is closely allied to *Stictoptera*, but differs in its somewhat less produced comparatively broader primaries, on which are sometimes (I think not always, unless they tend to disappear in set specimens) little spots of raised scales. Like all the Lophopteridæ, the frenulum is single in both sexes, and as the antennæ are also simple, the discrimination of the sexes is not easy, until one's eye becomes accustomed to the difference in the form of the thorax, and the slightly more slender antennæ of the female.

(To be continued.)

NOTES AND OBSERVATIONS.

Natural and Artificial Extermination of Lepidoptera.—Some years ago I planted, in a small reservoir, some *Typha latifolia*, which in due time became a flourishing little colony. After a time *Nonagria typhæ* was found to have made a settlement amongst it, though the nearest place where the plant grows is nearer three miles than two, and it is in very sparing quantity there. In the spring of 1892, as the young *Typha* came up, it was found to be swarming with young larvæ of *N. typhæ*, often ten to twenty in one shoot. The result was that not one *Typha* plant grew a flower-head, and not one *N. typhæ* larva produced a moth. In 1893 the moth was entirely absent, and the plant flowered abundantly. This spring (1894) I see traces of young *N. typhæ* larvæ, showing that a moth had again reached the spot last summer. This shows how far moths may travel to a vacant habitat, and is especially interesting as showing how a moth in a limited habitat may exterminate itself by its own luxuriance and abundance. As an illustration how much more this natural process is effective than any injudicious collecting by the entomologist, it may be noted that last year Dr. Wood and I, wishing to study the insect, took from *Poa aquatica*, in the same small reservoir, all the *Chilo forficellus* we could find. But I see the larvæ are there again this spring.—T. A. Chapman; Firbank, Hereford, June, 1894.

Entomological Cabinets.—A question frequently asked by young collectors of British Lepidoptera, who are thinking of setting up their first cabinet, is "how many drawers shall I be likely to require?" Now before advice on such an important matter can be given, it is necessary to ascertain the lines upon which the enquirer proposes to form his collection. If he intends to be satisfied with a short series of each species of Macro-Lepidoptera, he will probably find a cabinet of thirty or thirty-two drawers sufficient for his purpose; but if he desires to include the Micro-Lepidoptera, he will require at least forty drawers. Should he, however, happen to aspire to higher efforts, and will not be content with anything less than a collection which shall more or less fully represent the species in all their various forms as found throughout the British Islands, he will find that one hundred and fifty drawers will not be one too many for its proper accommodation. The present writer's arranged collection of British Lepidoptera comprises 25,000 specimens (14,300 Macros, 10,700 Micros), and is contained in one hundred and fourteen drawers as follows:—

	Drawers	Specimens		Drawers	Specimens
Rhopalocera	15	2072	Pyralides	3	1045
Sphinges and Bombyces	11	1575	Pterophori	2	566
			Crambi	4	984
Noctuæ	29	5082	Tortrices	12	5210
Geometræ	26	5571	Tineæ	12	2895

It will be seen that only fifteen drawers are assigned to the butterflies, but the series of several species in this department are too short, and at least five more drawers are required. Several additional drawers should also be given to the Sphinges, Bombyces, and Noctuæ. As previously stated, a really good representative collection of the Lepidoptera of the British Islands cannot be contained in less than one hundred and fifty drawers, and the most convenient arrangement would be to have this number made up into three cabinets of forty drawers each, and one of thirty drawers. One large cabinet might then be devoted to the Rhopalocera, Sphinges and Bombyces; another to the Noctuæ; and the third to the Geometræ, Pyralides, Crambi, and Pterophori. The drawers of the fourth cabinet may be reserved for Tortrices and Tineæ. In the matter of dimensions of the drawers, the most convenient size is 17 or 18 in. × 16 in., and the depth need not be more than $1\frac{15}{16}$ in. for the Macros, which will give a space of about $1\frac{1}{4}$ in. from cork to glass; for the Micros, $1\frac{13}{16}$ in., or about 1 in. from cork to glass, is sufficient. Probably the best wood of which cabinets can be made is well-seasoned mahogany, and they can be obtained in this material at from 10*s*. to 25*s*. per drawer. For all practical purposes, those at the lower price are quite good enough.—Richard South.

Scarcity of Butterflies.—I do not know if it is the same everywhere this season, but at this place, and at Chatham and Sheerness, during the past four weeks, the scarcity of butterflies has been remarkable. On many occasions I have been out on warm, bright days and have not seen a dozen of our common Pieridæ; and I have not seen a single *L. egeria*, only two or three *megæra*, and but a couple of *C. pamphilus*, the latter species being usually abundant in our marshy meadows. The weather at the beginning of this week was delightfully bright and warm, on the 18th it became bitterly cold, and to-day we have had several sharp showers of hail and sleet.—Gervase F. Mathew; Dovercourt, May 20th, 1894.

A supposed New Species of Euchloë.—In the Entomologist's Record for April, reference is made to a probable new species of *Euchloë*. The butterfly is described as much smaller than *Euchloë* *cardamines*, "measuring on an average only about an inch and a quarter from tip to tip of the fore wings," and as having the black discoidal spot situated "at the juncture of the orange and white spaces, not, as in *E. cardamines*, well within the orange tip," the costa of the fore wings being sprinkled with black. When viewed under the microscope, it is stated "the wing-scales appear to be very different from those of *E. cardamines*." I have a specimen taken here by myself answering to these particulars, except as regards the scales of the wing. After careful examination with the microscope, however, I can detect little or no difference in these. It may be that in the black discoidal spot in the typical *cardamines* they are narrower and longer than in the smaller insect. For this the writer proposes the name of *Euchloë hesperides;* but it seems to me that, without knowing more of the life-history of the insect, the distinctive characteristics are very slight for raising it to the rank of a species.—JOSEPH ANDERSON, Jun.; Chichester, Sussex.

SPILOSOMA MENDICA VAR. RUSTICA, AND AMPHIDASYS BETULARIA VAR. DOUBLEDAYARIA.—A writer in the June number of 'Societas Entomologica,' referring to these two varieties, says that the former is abundant and constant in Roumania, and stated that the latter, which has hitherto been considered confined to England, now extends all over Germany, including Silesia and Saxony.—N. F. DOBREE; Beverley, Yorkshire, June 12th, 1894.

NEPTICULA TORMENTILLELLA?—From mines in *Tormentilla officinalis*, obtained at Windermere last October, I am now breeding a very distinct looking *Nepticula*. The larvæ were of a deep yellow colour; the mines were conspicuous, and there were several on a plant. The sexes of the moth are of the same type, but the female is much larger than the male. This species should be the *N. tormentillella* which was expunged from our lists in favour of *N. serella*. The specimens are as large again as those of *N. serella*. I may add that the species, which I will call *N. tormentillella*, is exceedingly local, although the food-plant is plentiful enough in some of the woods.—J. B. HODGKINSON; Ashton-on-Ribble, April 12th, 1894.

EXTRACTION OF SUGAR FROM THE BODIES OF INSECTS.—It is well known that Noctuæ, when gorged and glutted with sugar, are apt, if killed before the expulsion of their contents, to present an unsightly appearance; for after a variable time the more fluid portions of the sugaring compound will sometimes permeate the tissues, and cause darker stains upon the surface than even grease itself; while, many years after having been converted into specimens, black bead-like drops have been observed to exude from pin-pricks in the bodies of such species as *Scopelosoma satellitia* and *Cerastis vaccinii*. This condition of things is by no means difficult to remedy. The plan here suggested is to double up a small piece of tinfoil, run a pin up to the head through it, and stand it, pin-point upwards, in a tea-cup; then break off the body to be operated upon, stick it thoracic end downwards on the pin, and cover the whole with *cold distilled water* for an hour or so. The object of thus fixing the body is to keep it off the bottom of the vessel, in order that the offending matter as it melts may sink with as little soiling of the external surface of the abdomen as possible. The body should then be secured, thoracic end up, and thoroughly dried in a current of warm, dry air before being refixed in its original position. Of course several bodies can be thus treated simultaneously. The advantages of *distilled* water over the fluid supplied by the water companies are that it contains neither organic matter nor salts, such as sulphates and chlorides, and is consequently a much better solvent for the purpose; and, secondly, that the necessity for boiling, which must be very detrimental to the tissues of the insect, is obviated.—H. Guard Knaggs; London, N.W., June 4th, 1894.

Chariclea delphinii (Pease-blossom).—To my mind this is one of the most beautiful of our British moths, and may briefly be described as being of a pale greyish ochreous with a lovely tinge of rose. The caterpillar is also a pretty creature, being of a reddish or bluish white; the food-plant is larkspur. Not having occurred in England for a great many years, it has been erased from the British lists, although it has as good a right to stand in them as *Chrysophanus dispar* and *Noctua subrosea*, except, perhaps, that like *P. moneta*, it may have been introduced into this country amongst garden plants. Its caterpillar, though, is reported by Merian and Rosel to feed upon the wild larkspur that grows among corn. Wilks informs us that as long ago as 1773 this fly had been bred in England by the Hon. Mrs. Wither, and by Nathaniel Oldham, Esq., but was very rare. A wing is said to have been found "at Bulstrode, in a spider's web, by the celebrated Duchess of Portland; and another in St. James's Park; and in July, 1799, Mr. W. Jones took a very perfect specimen in his garden at Chelsea." Haworth informs us that these are the only instances of its occurrence in England, and that it is so rare in Germany as to sell for a guinea a pair. One specimen of *delphinii* was sold in lot 3186 of the Duchess of Portland's effects, on May 27th, 1786. This is probably the specimen taken in St. James's Park. In June, 1815, a specimen or two were taken at Windsor by Mr. Griesbach. In more recent times three specimens are recorded in the 'Intelligencer' for December 19th, 1857.—C. W. Dale; Glanvilles Wootton, Sherborne, Dorset.

'European Butterflies and Moths.'—Messrs. Cassell & Co. are now publishing, in monthly parts, a new series of Kirby's 'European Butterflies and Moths.' At a recent auction sale a copy of the last edition of this work realised twenty-six shillings.

CAPTURES AND FIELD REPORTS.

Early Dragonflies.—Despite the inclement weather I am able to record several dragonfly captures, all in the neighbourhood of Oxshott, Surrey. The first to fall to the net was a single specimen of *Libellula quadrimaculata* on April 25th. It was weak on the wing, and appeared as if only lately out. I took others, male and female, on April 29th, and again on May 14th, while one was found at rest on the evening of May

18th, all by the margin of the Black Pond in Claremont Woods. Large numbers of both sexes of *Pyrrhosoma minium* were on the wing at the same spot on April 29th, and I took the same species on May 14th and one specimen on June 3rd, while one emerged from a pupa out of the pond on May 4th. Females of *Platetrum depressum* were on the wing in the district on May 14th, on which day *Agrion* [*Enallagma*] *cyathigerum* swarmed near the pond. Of the latter species I saw one or two specimens on June 3rd, a dull day, on which date I also took one *Agrion pulchellum* and one *A. puella* in the same place. In addition to the above I have bred two specimens of *Brachytron pratense*, a male on May 19th, and a female on May 24th, from pupæ taken from the Basingstoke Canal, near Byfleet, on March 23rd ult.—W. J. LUCAS; 2, Gordon Road, Kingston-on-Thames.

LEUCOPHASIA SINAPIS AND MELITÆA ARTEMIS IN CO. WATERFORD.—On May 16th I captured two very fresh specimens of *L. sinapis*. These are the first "wood whites" that I have seen here. I went again to the same place on the two following days, but saw no more. My friend Mr. R. Reynett took one specimen here five years ago. He has been successful in obtaining seven this year. On April 26th last I found, near here, three larvæ of *Melitæa artemis*. They were feeding on one of their food-plants, *Scabiosa succisa*. Two of them have already changed to pupæ. The third is now hanging suspended and doubled up, preparatory to its change.—(Rev.) WILLIAM W. FLEMYNG; Coolfin, Portlaw, Co. Waterford, May 22nd, 1894.

XYLOMIGES CONSPICILLARIS IN WORCESTERSHIRE.—On April 8th I bred a specimen of *X. conspicillaris* from a pupa dug in Worcestershire last autumn.—H. PERKS; 19, Barrett Street, Manchester Square, W.

COLIAS HYALE AT DOVERCOURT.—On May 13th inst., which was a bright warm day, I noticed one of these butterflies on the wing. It had apparently just come in from the sea.—GERVASE F. MATHEW; Dovercourt.

PACHETRA LEUCOPHÆA IN SURREY.—While collecting with the members of the South London Entomological and Natural History Society, at their field meeting at Reigate yesterday, I had the good fortune to take a female specimen of *Pachetra leucophæa* at rest on a bank side. The capture is interesting on account of being made in the same district, although not in the immediate neighbourhood, that Mr. Stevens met with the insect nearly forty years ago.—ROBT. ADKIN; Lewisham, June 10th, 1894.

STIGMONOTA RAVULANA IN LANCASHIRE.—My first excursion to Grange-over-Sands this year was on Saturday last, a bitterly cold and sunless day. No *Catoptria aspidiscana*, *Nepticulæ* or *Lithocolletis* were obtained, but by sweeping the birch twigs I captured plenty of *Phlœodes tetraquetrana* and some odds and ends, among which I discovered on closer examination, when I arrived home, one specimen of *S. ravulana*.—J. B. HODGKINSON; Rosebery House, Ashton-on-Ribble, May 21st, 1894.

VANESSA CARDUI COMMON AT TENBY.—I am pleased to see hybernated *V. cardui* about this year in great numbers; they are by far the most plentiful butterfly here at present; in fact, on some parts of the railway banks they simply swarm, a great contrast to last year, during which I saw but two specimens. Of *Colias edusa* I have not seen one this year so far, Insects, taken all round, are scarce here this season, and rather backward: however, on the oaks close to this, larvæ were fairly plentiful, chiefly *Tæniocampa stabilis*, *T. cruda*, and *T. miniosa* (which occurred also frequently on bramble, and a few on honeysuckle), and many common geometers.—Spotswood Graves; 29, Victoria Street, Tenby, June 14th, 1894.

Deilephila livornica in Devonshire.—On the evening of June 7th I captured a specimen of *D. livornica* flying round the flowers of rhododendrons.—John N. Still; Horrabridge.

Early Appearance of Smerinthus tiliæ.—On April 26th a fine specimen of this moth was taken, freshly emerged, in the Shooters Hill Road, and is now in my collection. As far as personal observation goes, I have found it scarce round here, and never so early as this date.—J. N. Smith; 30, Shooters Hill Road, Blackheath, S.E., April 30th, 1894.

Heterocera from Caussols, Alpes-Maritimes.—One of the insects which I thought was probably referable to *Lithosia lurideola* (Entom. 178) has been submitted to Herr Ernst Heyne, of Leipzig, who has identified it as *L. complana*. *Aporophyla lutulenta* var. *sedi*, also determined by Herr Heyne. *Bombyx quercus* and *B. rubi* (larva) are also additions to the list.—F. Bromilow; Nice, Alpes-Maritimes, France, May 6th, 1894.

The Hemiptera-Heteroptera of Purfleet, Essex.—After having worked this neighbourhood for several years during the months of August and September, I am able to furnish the following list, which I believe to be correct as far as it goes. Only single examples have been captured of those species marked with an asterisk:—*Eurygaster maura*, *Sehirus bicolor*, *S. albomarginatus* (two dead specimens), *Ælia acuminata* (one imago and larva together), *Tropicoris rufipes*,* *Verlusia rhombea*,* *Myrmus miriformis*, *Scolopostethus affinis*, *Drymus sylvaticus*, *Stygnocoris rusticus*, *Piesma quadrata*, *P. capitata*,* *Monanthia ampliata*, *Derephysia foliacea*, *Miris calcaratus*, *Megalocerœa erratica*, *M. longicornis*, *M. ruficornis*, *Teratocoris saundersi*,* *Leptoterna dolobrata*, *L. ferrugata*, *Pantilius tunicatus*, *Phytocoris longipennis*, *P. reuteri*, *P. varipes*, *P. ulmi*, *Oncognathus binotatus*, *Calocoris infusus*, *C. chenopodii*, *C. bipunctatus*, *Rhopalotomus ater*, *Capsus laniarius*, *Liocorus* 3-*pustulatus*, *Pœciloscytus nigritus*,* *Hadrodema pinastri* (two specimens), *Plesiocoris rugicollis*,* *Lygus pratensis*, *L. pabulinus* *L. viridis*, *L. kalmii*, *L. cervinus*, *Camptobrochis lutescens*, *Monalocoris filicis*, *Pithanus maerkeli*, *Campyloneura virgula*, *Ætorrhinus angulatus*, *Chlamydatus ambulans*, *Byrsoptera rufifrons*, *Dicyphus pallicornis*, *D. pallidus*, *D. constrictus*, *Malacocoris chlorizans*, *Pilophorus clavatus*, *P. bifasciatus*, *Halticus luteicollis*, *H. apterus*, *Orthocephalus saltator*, *Loxops coccineus*,* *Orthotylus bilineatus*, *O. nassatus*, *Heterotoma merioptera*, *Macrocoleus hortulanus*, *H. molliculus*, *Oncotylus decolor*,* *Phylus coryli*, *P. avellanæ*, *Psallus salicellus*, *Plagiognathus viridulanus*, *P. arbustorum*, *Acompocoris pygmæus*, *Acanthocoris nemorum*, *A. nemoralis*, *Piezostethus galactinus*, *Thriphleps minuta*, *Lyctocoris campestris*, *Acanthia lectularia*, *Ploiaria vagabunda*, *Nabis brevipennis*, *N. lativentris*, *N. major*, *N. flavomarginatus*, *N. limbatus*, *N. ferus*, *N. rugosus*, *Salda cocksii*, *Hydrometra stagnorum*, *Gerris thoracica*, *G. lacustris*, *Velia currens*, *Notonecta glauca* (var. *maculata*), *Nepa cinerea*. On June 3rd, 1893, I took the following, which are not mentioned above:—*Lygus contaminatus*, *Psallus betuleti*, *P. ambiguus*, *P. varians*, *P. alnicola* (?).—R. M. Leake; 15, Alleyu Park, S.E., June, 1894.

Notes from Hants.—The following species seem to have been early on the wing this year:—*Euchloë cardamines* and *Lycæna argiolus*, April 13th; *Asthena candidata*, 15th; *Pieris brassicæ*, and *Bapta bimaculata* (= *taminata*), 16th.—W. M. Christy; Watergate, Emsworth, Hants.

Captures in Oxfordshire.—On May 25th I succeeded in capturing five freshly emerged specimens of *Nemeobius lucina* in Bagley Woods, near Oxford. In the same place I came across larvæ of *Tethea retusa* and *Tæniocampa miniosa* in abundance. I have been up since with a friend beating for larvæ, and we obtained *Thecla quercus*, *Pœcilocampa populi*, *Dasychira fascelina*, *Hylophila bicolorana* (= *Halias quercana*), &c. The trees are absolutely stripped by *Cheimatobia brumata*, *Tæniocampa gothica*, *Calymnia trapezina*, *Hybernia defoliaria*, *Phigalia pedaria* (= *pilosaria*) and numerous other larvæ. — H. W. Shepheard-Walwyn; Hertford College, Oxford, June 4th, 1894.

Captures in Argyllshire. — A considerable number of larvæ of *Melitæa artemis* taken April 15th, on rough pasture land close to the sea (Sound of Jura), feeding on devil's-bit scabious. The first perfect insect emerged June 7th, having attained the chrysalis stage May 9th. A few larvæ are still feeding. *Thecla rubi* has been very abundant here; also *Argynnis euphrosyne*. April 25th, *Macroglossa stellatarum*; 13th, *Phlogophora meticulosa* (abundant); 22nd, *Numeria pulveraria*; 23rd, *Panagra petraria*; 29th, *Melanippe hastata*. June 6th, *Arctia fuliginosa*. Larvæ of *Bombyx quercus* plentiful on heather.—(Miss) M. L. Cottingham; Kilberry, Argyllshire, June 10th.

SOCIETIES.

Entomological Society of London.—*June 6th*, 1894.—Henry John Elwes, Esq., F.L.S., President, in the chair. Dr. K. Jordan, of "The Museum," Tring, and the Honble. Nathaniel C. Rothschild, of Tring Park, Tring, were elected Fellows of the Society. Mr. W. F. H. Blandford exhibited a series of eleven male specimens of *Rhina barbirostris* from British Honduras, of which the largest and smallest examples measure respectively 60 and 17 mm. The difference in bulk, supposing the proportions to be identical, is as 43 to 1. He remarked that this variation of the size is especially common in the Brenthidæ, Cossonidæ, and other wood-boring Coleoptera. The President, Dr. Sharp, the Rev. Canon Fowler, Mr. Jacoby, the Honble. Walter Rothschild, Mr. Merrifield, and Mr. Champion took part in the discussion which ensued. Mr. A. J. Chitty exhibited specimens of *Cardiophorus equiseti* taken near Braunton, on the north coast of Devon, in May, 1891. Mr. Champion and Mr. Blandford made some remarks on the species. Mr. McLachlan exhibited, for Mr. J. W. Douglas, male specimens of a Coccid (*Lecanium prunastri*), bred from scales attached to shoots of blackthorn (*Prunus spinosa*) received from Herr Karel Sulç, of Prague. Mr. Douglas communicated notes on the subject, in which he stated that the species was common on blackthorn in France and Germany, and should be found in Britain.

Lord Walsingham exhibited a series of *Cacoecia podana*, Scop., reared from larvæ feeding on *Lapageria* and palms in Messrs. Veitch's conservatories in King's Road, Chelsea, including some very dark (melanic) varieties. The Honble. Walter Rothschild stated that he had taken the species on lime. Mr. Hampson and Mr. Tutt also made some remarks on the habits of the species. Mr. C. Fenn exhibited a long series of *Selenia lunaria*, bred from one batch of eggs, which included both the spring and summer forms; and also two unforced specimens, which emerged in November. He remarked that the variation between the two emergences, *viz.*, spring and summer, is considerable, and also the range of variation *inter se*, especially in the spring form; but it is very remarkable that the summer form has one or two representatives among the specimens of the spring emergence. He said that the parent female was taken at Bexley in May, 1893. Mr. F. Lovell Keays exhibited, on behalf of Mr. A. Lovell Keays, a variety of *L. alexis* (female), having the marginal ocelli on the hind wings entirely without the usual orange-coloured lunules. The specimen was captured at Caterham on May 22nd, 1894, and was the first example of the species observed by the captor this season. Mr. Barrett made some remarks on the specimen. Mr. J. H. Durrant exhibited a series of *Steganoptycha pygmæana*, Hb., taken at Merton, Norfolk, between the 25th March and the middle of April last. Lord Walsingham made some remarks on the species. Mr. H. Goss read an extract from a report from Mr. J. R. Preece, H.M. Consul at Ispahan, to the Foreign Office, on the subject of damage caused to the wheat crop in the district of Rafsinjan, by an insect which was called "Sen" by the natives, and which he described as "like a flying bug, reddish olive in colour, with heavy broad shoulders." Mr. Goss said he had been asked by Mr. W. H. Preece, C.B., to ascertain, if possible, the name of the species known to the natives as "Sen." Dr. Sharp said that in the absence of a specimen of the insect it was impossible to express an opinion as to the identity of the species. The Rev. Canon Fowler exhibited, for Miss Ormerod, specimens of *Diloboderus abderus*, Sturm, *Eucranium arachnoides*, Brull., and *Megathopa violacea*, Blanch., which she had received from the La Plata district of the Argentine Territories, where they were said to be damaging the grass crops. He also read notes from Miss Ormerod on the subject. Mr. Hampson raised an important point as to what was the legal "date of publication" of Part I. of the Transactions of the Society, 1894. He pointed out that the question of the priority of the names of certain new species described therei would depend upon the date of publication. A long discussion the ensued, in which Dr. Sharp, the Honble. W. Rothschild, Mr. Goss Mr. McLachlan, Lord Walsingham, Prof. Poulton, and Mr. Verral took part. Prof. Franz Klapálek, of Prague, communicated a pape entitled "Descriptions of a new species of *Raphidia*, L., and of thre new species of Trichoptera from the Balkan Peninsula, with critic remarks on *Panorpa gibberosa*, McLach." Lord Walsingham the took the chair, and a Special General Meeting convened unde Chap. XVIII. of the Bye-Laws was held.—H. Goss & W. W. Fowle *Hon. Secs.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*Whitsuntide Excursion*, 1894. A small party from this Society spent from May 12th to 15th in the neighbourhood of Selsley, on the Cotswolds. In consequence of the unfavourable weather the collections made were below expectations, and consequently there was some disappointment. The lepidopterists took numbers of larvæ of *Callimorpha dominula*, *Nemeophila plantaginis*, *Nudaria mundana*, &c., and found *Nemeobius lucina* and other insects on the wing, but nothing of importance. The hymenopterists were well satisfied with their captures; and although the dipterists, owing to want of sun, took comparatively little of interest, yet they succeeded in adding two new species of *Syrphus* to the British list, Mr. R. C. Bradley taking one specimen of *Syrphus triangulifer*, Zett., and Mr. C. J. Wainwright one of *S. annulipes*, Zett. On the Monday a drive to Cranham Woods was taken, in the company of two local entomologists, Messrs. Frank Stephens and R. W. Fitzgerald; and on the way back tea was taken at the house of Mr. C. J. Watkins, Painswick, and two hours profitably spent in an examination of his collections of Diptera, Hymenoptera, &c.

May 21*st*.—Mr. G. T. Bethune-Baker, Vice-President, in the chair. Exhibits:—Mr. W. Harrison, living larvæ of *Callimorpha dominula* taken during the Society's excursion to Selsley-on-the-Cotswolds. Mr. A. H. Martineau, pupæ of *Crabro interruptus*, dug out of an old rotten stump at Middleton. Mr. P. W. Abbott read a paper upon the genus *Hadena*, in which he dealt with:—1st. The position of the genus, which he considered should follow *Apamea*. 2nd. The distribution of the genus in our own district; he only knew of the occurrence of eight species, though *suasa* and *trifolii* might have to be added. 3rd. Variation, which he described at some length; generally concluding that it was not a variable genus. 4th. Life-history; describing the life-history of *glauca*, which he knew well in Sutton Park, at some length. He showed the drawer from his cabinet containing the genus, and other members also showed specimens.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LEICESTER LITERARY AND PHILOSOPHICAL SOCIETY (Entomological Section).—*February* 27*th*, 1894.—W. A. Vice, Esq., M.B., in the chair. Exhibits:—Mr. C. B. Headly, larvæ of *Œstrus bovis*. Mr. F. Bouskell, life-histories, with ova, larvæ, pupæ and imagines, of *Bombyx neustria*, *B. quercifolia*, *Orgyia antiqua*, *Biston hirtaria* and *Papilio machaon*; and he recommended the formation of local and British collections by the section, showing, where possible, the life-histories. In reply to an inquiry as to the best means of dealing with the onion grub, which is very prevalent in the district, the cultivation of onions in trenches, and covering up of the bulbs according to Miss Ormerod's plan, was recommended.

April 2*nd*.—W. A. Vice, Esq., in the chair. The Hon. Sec. read the report of the Easter excursions to Charnwood Forest, the chief captures being *Brephos parthenias* (in good condition, out fourteen days earlier than last year); *Cymatophora flavicornis* (one at rest, and one on the wing in the bright sunshine), *Hybernia leucophæaria*, *H. progemmaria*, *Anisopteryx æscularia*; at sallow, *Pachnobia rubricosa* (11), *Tæniocampa gothica*, *T. stabilis*, *T. instabilis* (very variable), *T. pulverulenta*, *T.*

gracilis (1), *T. munda* (2), *Cerastis vaccinii* (8, exceedingly variable), *Scopelosoma satellitia* (11, variable), *Xanthia ferruginea* (1). Coleoptera:—*Rhagium inquisitor* (8) and a number of larvæ out of an old stump, *Ips 4-guttata* (plentiful under bark), *I. 4-pustulata* (at sap), *Rhizophagus dispar*, *R. bipustulatus*, *Rhinosimus planirostris*, *Ilybius ater*, *I. obscurus*, *Acilius sulcatus*. Exhibits:—Mr. Moss, *Sinodendron cylindricum*, *Dorcus parallelopipedus*, *Barynotus obscurus*, *B. schonherri*, *B. mæreus*, from near Loughborough; larvæ of *Acherontia atropos*, *Smerinthus ocellatus*, *Chærocampa elpenor*, *Cossus ligniperda*, *Bombyx quercus*, *Notodonta ziczac*, *N. dictæa*, all from the same district. Mr. Dixon, *B. parthenias*, *Amphidasys prodromaria* (dark form), and *T. leucophæaria*. Mr. Scott, very variable series of female *Lycæna alexis*, also Lepidoptera from the South of France. Mr. Bouskell, series of *Nyssia hispidaria* from Buddon Wood, all taken on oak-trunks within twelve inches from the ground, none being found higher up; also an exceedingly variable series of *H. leucophæaria*, with several melanic and light forms; ova of *T. stabilis*, *T. instabilis*, *T. rubricosa* and *B. parthenias*. Mr. Headly, larvæ of *Cymatophora ridens*, *Cucullia verbasci*; imagines of *C. ridens*, *C. or*, *Brephos notha*, and *Monochammus sartor*; the last named was taken in Leicester on a willow trunk. The Secretary then read a short paper "On the British Micro-Lepidoptera," by the Rev. C. T. Cruttwell, M.A. A long discussion ensued, in which the chairman, Messrs. Moss, Scott, Dixon, Headly, and Bouskell joined. A hearty vote of thanks to the author was passed, and it was resolved to print the paper in the Transactions. Two excursions were arranged, April 14th, Bardon Hill; and April 28th, Narborough Bogs. The next meeting was fixed for April 30th.—Frank Bouskell, *Hon. Sec.*

RECENT LITERATURE.

Alternating Generations: a Biological Study of Oak-Galls and Gall-Flies. By Hermann Adler, M.D. Translated and edited by Charles R. Straton, F.R.C.S., F.E.S. 8vo, pp. xliii, 198. Oxford: Clarendon Press. 1894.

In addition to an excellent translation of Dr. Adler's remarkable work, Mr. Straton has prepared a copious introduction to the subject of alternation of generations; a chapter on *Cynips kollari*; a synoptical table of oak-galls; and a classified list of the Cynipidæ with their food-plants. There are three plates; one of these is anatomical, and on the others the various galls found on oak are represented in colour. These figures will enable anyone to readily identify any oak-gall he may meet with. We have no doubt this book will not only be of much value to all who study the British galls and the insects which produce them, but also be of great interest to many who may not have read the original monograph.

Monograph of the North American Proctotrypidæ. By W. H. Ashmead. Washington. 1893.

This work, being the forty-fifth bulletin of the U. S. Nat. Mus., cannot fail to be of immense value to the student of the American fauna north of Mexico. The descriptions are good and accurate, and the drawings,—of which there are eighteen plates,—outlines of the various genera, will be sufficient to help even the field-worker to find at a glance any insect he requires.

Mr. Ashmead thinks that the Proctotrypidæ are not closely allied to the Chalcididæ, and with him I quite agree. They have more affinity with the parasitic Cynipidæ, and are not far removed from the Evaniidæ and Pelecinidæ.

In the Introduction directions are given as to distinguishing a Proctotrypid from the Chalcididæ and Aculeate Hymenoptera.

The life-history is graphically described, and the distribution of the family shows that the author is not unacquainted with his subject.

The following analysis will give a faint idea of the construction of the work. The Proctotrypidæ are divided into ten subfamilies:—(1) Bethylinæ, (2) Emboleminæ, (3) Dryininæ, (4) Proctotrypinæ, (5) Ceraphroninæ, (6) Belytinæ, (7) Diapriinæ, (8) Platygasterinæ, (9) Scelioninæ, (10) Helorinæ.

The first subfamily contains seventeen genera, two being new, *Dissomphalus* and *Lælius*. Emboleminæ consists of three genera, one described as new, *Ampulicomorpha*. The third family consists of nine genera, two being new, *Bocchus* and *Phorbas*. The Ceraphroninæ are divided into two tribes—(1) *Megaspilini*, founded upon "marginal vein stigmated, antennæ with same number of joints in both sexes, 11-jointed"; and (2) *Ceraphronini*, "marginal vein not stigmated, linear antennæ with a less number of joints in the females than in the males; males 10- or 11-jointed, females 9- or 10-jointed." The former contains nine genera, the latter three, one being new, *Neoceraphron*. The Scelioninæ are divided into four tribes—(1) *Telenomi*, (2) *Bæini*, (3) *Teleasini*, (4) *Scelionini*. The first contains six genera, three, *Trissolcus*, *Dissolcus*, *Aradophagus*, being new. The second consists of five genera, one being new, *Ceratobæus*. The third contains seven genera, one new, *Hoplogyron*. The last section contains nineteen genera, the following being new:—*Calliscelio*, *Chromoteleia*, *Opisthacantha*, *Lapitha*, *Hoploteleia*, *Cremastrobæus*, *Acanthoscelio*, *Sceliomorpha*. The Platygasterinæ are divided into two tribes—*Inostemmini*, "anterior wings with a distinct clavate submarginal vein"; *Platygasterini*, "anterior wings entirely veinless, rarely with indications of a submarginal vein, which if present is very short and never clavate." The first section contains seven genera, the second seventeen, two being new, *Cœlopelta* and *Eritrissomerus*. Proctotrypinæ contains three genera—*Disogmus*, Forst., *Proctotrypes*, Lat., and *Codrus*, Jur. The Belytinæ contains nineteen genera, whilst the Diapriinæ are divided into two tribes—*Spilomicrini*, "submarginal reaching the costa at about half of the wing or a little before, costal cell most frequently closed"; *Diapriini*, "submarginal vein never reaching the costa beyond one-third of the wing; costal cell most frequently open." The former consists of twelve genera, three being new, *Hemilexodes*, *Tropidopsis*,

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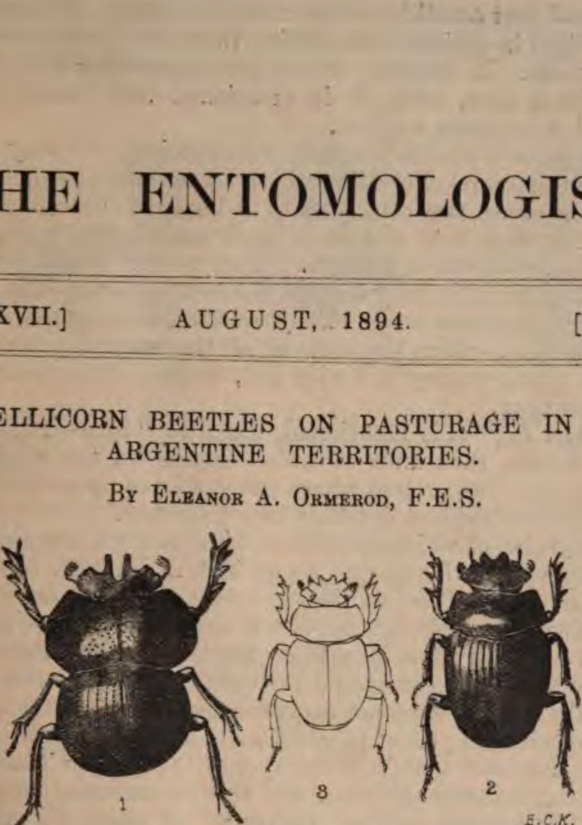
LAMELLICORN BEETLES ON PASTURAGE IN THE ARGENTINE TERRITORIES.

By Eleanor A. Ormerod, F.E.S.



1, *Euoranium arachnoides*, life-size; 2, 3, *Megathopa violacea*, life-size, and magnified.

The following observations regarding damage caused to pasturage by infestation of Lamellicorn beetles, in the Argentine Territories of South America, are offered in the hope that readers who have more especially studied the habits of exotic Coleoptera may possibly be good enough to furnish some additional details of life-history of one or other of the species named, which may aid in checking their increase.

On May 7th reports were placed in my hands by Mr. Henry Watts, Secretary of the South American Land Company, relative to damage caused to pasturage on the enclosed ground of the Company, by a white grub feeding at certain seasons at the roots of the grasses. This attack, it was mentioned, was only, or almost entirely, observable on the fenced-in land on which sheep, cattle, and horses are pastured, and in one of the reports from the resident Manager or representatives of the Company it was mentioned that one-third of the fenced-in camp, or about 40,000 acres, might be estimated as having the grass destroyed by injury at the roots. In another report sent somewhat later, bearing date March 21st, 1894, it is mentioned that nearly half the "camp" must have suffered.

The reports noted, amongst other points, "Every year we have a good crop of beetles, which at certain seasons you find travelling along the cattle-tracks in hundreds; it appears to be from their eggs that the white grub comes, and a dry season seems to favour their growth. They select the higher lands, where they have literally dug up the earth, leaving it as loose as if a spade had been used. They work within a couple of inches of the surface, eating the roots of all the grass they find, so the pasture withers away and dies out, leaving the ground as if it had been hoed."

"Later on," it is mentioned, the grub "turns into a kind of horned beetle, thousands of which appear on the surface, and coming out of the ground where the grub was numerous leads to the belief that the one develops into the other."

The grubs, of which specimens were sent me, ranging in size from about a quarter-grown, to an inch and a half, the greatest length named in the written communication, were obviously larvæ of some Lamellicorn beetles, fleshy, cylindrical, with reddish head, a pair of rather long hairy legs on each of the segments next the head, and the caudal extremity blunt and enlarged.

Of the beetles sent me all the collection (with the exception of two specimens) proved to be males and females of the "horned beetle" mentioned as coming up by "thousands" out of the grub-ravaged pasture ground, and this on examination proved to be the *Diloboderus abderus*, Sturm.* Of these the males are thick-made, oval beetles, about ten lines long, and five and a half across, black, with a kind of grey hoariness; the head furnished with a long, pointed, curved-back horn, and the thorax with a short, thick, and broad horn-like process, bifid at the extremity and pointing forward, and furnished on the under side with a short thick yellow silky fringe. The females are distinguishable by the absence of the horns.

The accompanying figure, drawn from the specimens sent, gives a very fair idea of the appearance of these beetles, and also of the Lamellicorn larvæ, of which specimens were sent from the infested ground.

Here, however, a point occurs of very considerable agricultural importance, and which possibly the presence of the other beetles sent may throw some light on. It is noted in the reports sent over, that where this wide-spread grub-destruction of pasturage takes place, the bitter, or coarse and useless grasses disappear, and are replaced by better kinds, so that the nature of the pasturage is very greatly improved. On the face of the thing, it does not seem clear why this should be from the effects of the damage caused by the infestation of the "horned beetle," the *Diloboderus abderus*. We know that others of the Dynastidæ, as, for instance, the so-called "Keever beetle," the *Heteronychus arator*, Fab., do much mischief at the roots of wheat crops in South Africa; and the *Pentodon nireus*, Burm, and *P. contractus*, Bohm, both of them Caffrarian beetles, were also sent over to me as wheat pests. But these destructive habits of the Dynastidæ scarcely seem to account for a different and a better kind of grass following on the ravaged area, and it does not appear to be merely a destruction of the grasses, *then present*, which is followed by presence of a better sort, as amongst the notes sent from the local representatives of the S. American Co. is the following:—"Strange to say, the grub has done almost no damage on burnt camp, the eggs having been probably destroyed by fire, so they will take a much longer time to refine than camp which is never burnt."

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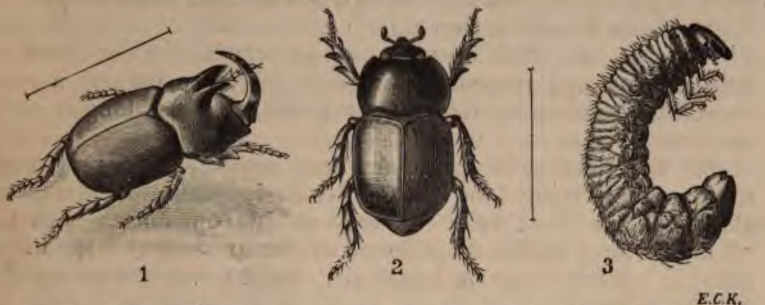
* For identification of these beetles and of the two other species named, as well as for copies of the original descriptions, I am indebted to Mr. Oliver *E. Janson*, *F.E.S.*



1, *Diloboderus abderus*, male; 2, female; both magnified, with lines showing natural length. 3, Lamellicorn larva, from ground infested by *D. abderus*.

This suggests whether it is not possible that some of the damage, and much of the succeeding benefit may be owing to the presence of the Scarabæid beetles, of which specimens of two kinds were forwarded to me (but without any remarks on them) in the bottle with the other beetles and larvæ. These were the large *Eucranium arachnoides*, Brullé (the *Anomiopsis dioscorides* of Westwood*), one of the so-called "Sacred beetles"; the other (also figured at p. 229) is the *Megathopa violacea*, Blanchard, found by M. d'Orbigny in Patagonia (D'Orbigny, 'Voyage dans l'Amérique Méridionale, Insectes Coléoptères,' par Blanchard).

Presuming these beetles to have the characteristic habits of the family, this might account for the improved growth of grass. Whether their larvæ can take a part in the destruction, or are only manure feeders, I do not know; but if on the stock-pastured ground any appreciable amount of the Scarabæid beetles exercised their talents for rolling up their eggs in balls of dung, digging little holes, and then burying the egg-containing enrichment, this digging and manuring would be likely to help to a good succeeding growth in many agricultural ways, too long to enter on here.

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* 'Trans. of Zool. Soc.' vol. ii., 1857, p. 160.

As the Scarabæid specimens sent me were apparently not noticed as differing from the others in the samples forwarded, this may also have been the case on the open area, and the observations of beetles being found at certain seasons "travelling along the cattle-tracks in hundreds," point towards some special attraction, such as might be found by dung-rolling beetles, as these so-called "tracks" are the paths made by the cattle, horses, &c., in their passage to and from the wells or drinking places.

Such a peculiar and wide-spread coleopterous attack on pasturage appears worth recording entomologically, especially in the hope that those versed in the minutiæ of extra-British Lamellicorn attack may throw some light on the details; but, failing this, the supply of specimens, and the further notes of observation which I understand I am, if possible, to be favoured with, may prove of a good deal of interest.

Torrington House, St. Albans, June 30th, 1894.

THE LEPIDOPTERA OF LINCOLNSHIRE.

By W. D. Carr.

The following list of Macro-Lepidoptera (exclusive of the Geometræ) has been compiled during the last three seasons, and includes only those species I myself have taken or in a few instances seen in the cabinet of a friend.

The localities chiefly worked were Hartsholme, Skellingthorpe, and Newball Woods; the former wood is two miles south of Lincoln, the geological formation being drift gravels resting on middle lias clay, the trees chiefly Scotch fir, birch, oak, and alder, with a good deal of larch, Austrian pine, heather, and in places sallow. Skellingthorpe Wood is six miles west of Lincoln on the lower lias clay; trees principally oak, birch, and elm. Newball Wood is eight miles north of Lincoln, on the Oxford clay; trees mainly oak and ash, with hazel undergrowth. In these two latter woods the stiff clays on which they are situate form a heavy, cold, and wet soil; these conditions, however, seem suitable for the growth of many species of flowering plants, for in the spring and early summer months the wider rides are carpeted with flowers and animated with insect life. Here *H. paniscus* (*Carterocephalus palæmon*) is at home, and in the May sunshine is to be seen by scores, flitting from flower to flower of the bugle, or chasing his fellows along the grassy rides.

Argynnis paphia. Skellingthorpe; last year common first week in July. The variety *valesina* not seen.—*A. aglaia.* Skellingthorpe.—*A. euphrosyne.* Common at Newball, May 15th, and Skellingthorpe, May 18th, 1893. — *A. selene.* About as common as above; same localities and dates.

Melitæa artemis (*aurinia*). Scarce at Newball in May.

Vanessa urticæ. Common.—*V. polychloros.* Newball.—*V. io.* Lanes, &c.; not common.

Pyrameis atalanta. Common in 1892; scarce last year at Lincoln, but fairly common on sand-hills near Skegness last August.—*P. cardui.* Common in 1892; rare last year.

Apatura iris. Seen both in Newball and Skellingthorpe Woods, but not taken.

Melanargia galatea. Common in a meadow near Newball four or five years ago.

Pararge egeria. Common near Lincoln and Woodhall Spa last August.

Epinephele ianira. Hartsholme, &c. — *E. tithonus.* Scarce. — *E. hyperanthus.* Abundant at Skellingthorpe in July.

Cœnonympha pamphilus. Common near Hartsholme and Newball.

Thecla w-album. Netted imago Aug. 6th, 1892; obtained full-fed larvæ and pupæ last year, May 27th, on elm.

Polyommatus phlæas. Common.

Lycæna icarus. Very common at Newball; less common, Skellingthorpe.

Colias edusa. A few taken near Hartsholme, 1892.

Gonopteryx rhamni. Rather scarce.

Anthocharis cardamines. Newball and Skellingthorpe.

Pieris napi, *P. rapæ*, *P. brassicæ.* Common.

Hesperia (*Nisoniades*) *tages.* Common at Newball and Skellingthorpe in May.—*H. paniscus* (*Carterocephalus palæmon*). Abundant at Newball; common at Skellingthorpe in May.—*H. sylvanus.* Newball and Skellingthorpe.—*H. linea* (*thaumas*). Roadsides.

Smerinthus ocellatus. Larvæ common on sallows, Hartsholme.—*S. populi.* Common.—*S. tiliæ.* Does not occur in the Lincoln neighbourhood, but I am informed that larvæ were taken from a lime-tree some few miles away, about ten years ago, and the insect bred in Lincoln.

Acherontia atropos. Larvæ occasionally found in potato-fields.

Sphinx convolvuli. Several were obtained about five years ago, but I have no more recent record.—*S. ligustri.* Rare.

Chærocampa celerio. A friend (Mr. E. Mead) obtained a single example of this rare moth a few years ago, which had flown into a cottage near Lincoln.—*C. porcellus.* One netted near Hartsholme in 1892.—*C. elpenor.* Larvæ rather common (1892) on bedstraw growing in wide drain; one imago netted.

Macroglossa stellatarum. Occasionally seen last season in gardens; larvæ discovered on yellow bedstraw.—*M. fuciformis.* Larvæ common on honeysuckle, Skellingthorpe, Newball, and Hartsholme; imagines taken at flowers of bugle and rhododendron in bright sunshine. — *M. bombyliformis.* Rare at Newball.

Sesia (*Trochilium*) *bembeciformis.* Rare.—*Sesia* (*T.*) *apiformis.* Rare.

Zeuzera æsculi. Rare.

Cossus ligniperda. Moth seldom seen; the only one I have came to a patch of sugar, and was netted. Many larvæ in willows.

Hepialus hectus, *H. lupulinus*, *H. sylvanus*, *H. humuli.* Hartsholme.

Procris (*Ino*) *statices.* Newball.

Zygæna filipendulæ. Lincoln; Newball.

Lithosia mesomella. Hartsholme; scarce. — *L.* (*Gnophria*) *quadra*, Hartsholme; scarce.—*L.* (*G.*) *rubricollis.* Newball, May 22nd, 1893; two specimens.

Euchelia jacobææ. Lincoln; at Skegness the ragwort on sand-hills is stripped by the larvæ.

Chelonia (*Nemeophila*) *plantaginis.* Larvæ common at Hartsholme in May.

Arctia caia. Not very common.

Spilosoma fuliginosa. Hartsholme. — *S. mendica*, *S. lubricipeda*, *S. menthastri.* Lincoln, &c.

Liparis (*Porthesia*) *auriflua.* Common.

Leucoma salicis. Larvæ on poplar; not common.

Psilura monacha. Skellingthorpe.

Dasychira pudibunda. Hartsholme.—*D. fascelina.* Has been taken at Hartsholme some years ago.

Orgyia antiqua. Common.

Demas coryli. Newball; rare.

Trichiura cratægi. Newball.

Pœcilocampa populi. Skellingthorpe; Hartsholme.

Eriogaster lanestris. Lincoln; Newball.

Bombyx rubi. Rare at Hartsholme; larvæ used to be common.—*B. quercus* and var. *callunæ.* Both at Hartsholme.

Odonestis potatoria. Lincoln, &c.; common.

Saturnia pavonia. Hartsholme; on heath.

Platypteryx (*Drepana*) *lacertula.* One specimen, Hartsholme, 1892. — *P.* (*D.*) *falcula.* Common at Hartsholme. — *P.* (*D.*) *hamula.* One specimen, Hartsholme, in 1892.

Cilix spinula. Hartsholme.

Dicranura furcula. Pupæ obtained under willow-bark; rather scarce. — *D. bifida.* Pupæ obtained under the bark of aspen; rare.—*D. vinula.* Common.

Phalera bucephala. Larvæ common on sallows.

Ptilodontis (*Pterostoma*) *palpina.* One obtained from dug pupa; Lincoln.—*P.* (*Lophopteryx*) *camelina.* Common.

Notodonta dictæa. A few larvæ taken each season, on poplar. — *N. dictæoides.* Commoner than above, but larvæ difficult to rear; Hartsholme, on birch. — *N. dromedarius.* Larvæ taken on birch and alder; scarce.—*N. ziczac.* Larvæ generally found on small black poplars.

Diloba cæruleocephala. Larvæ common on whitethorn.

Thyatira derasa. Hartsholme.—*T. batis.* Hartsholme. According to southern lists this species would appear to be double-brooded; it is certainly not so in Lincolnshire. Taken at sugar in June.

Cymatophora (*Asphalia*) *diluta*. One specimen, Hartsholme; common at Skellingthorpe in August, at sugar. — *C. or*. Newball, at sugar, May 23rd, 1893. — *C.* (*A.*) *flavicornis*. Hartsholme; common on the trunks and boughs of birch in March. Most text-books state that this species comes freely to sugar, but I have never been able to so obtain it, though have frequently sugared where I knew it to be.

Bryophila perla. Common on walls.

Acronycta psi. Common. — *A. leporina*. Hartsholme. — *A. megacephala*. Pupæ obtained when barking willows for "kittens."—*A. alni*. Hartsholme; two or three pupæ obtained every winter by splitting decayed twigs and branches of alder.—*A. rumicis*. Common.

Leucania conigera. Lincoln; netted in July flying over blossoms of snowberry.—*L. lithargyria*. Taken with above.—*L. comma*. Lincoln; at sugar in June. — *L. straminea*. Two specimens, taken from flowers of bulrush.—*L. impura*, *L. pallens*. These two species are very common on flowers of bulrush, and on flower-spikes of a very coarse grass growing in a ballast pit.

Nonagria typhæ (*arundinis*). Pupæ common in stems of reed-mace.

Calamia phragmitidis. Lincoln, on flowers of purple loosestrife.

Tapinostola fulva. Lincoln.

Chortodes (*Miana*) *arcuosa*. Lincoln; common on coarse grasses.

Gortyna flavago (*ochracea*). Pupæ common in stems of marsh thistle.

Hydræcia nictitans. At flowers of ragwort.—*H. micacea*. At light and sugar.

Xylophasia rurea. At sugar.—*X. lithoxylea*. At sugar.—*X. sublustris*. At sugar; one specimen only. — *X. polyodon* (*monoglypha*). Swarms at sugar; only one black variety taken.

Neuria saponariæ (*reticulata*). Lincoln. Two specimens at sugar, 1892.—*N.* (*Neuronia*) *popularis*. At light. Came commonly into our sitting-room near Skegness last August.

Charæas graminis. At flowers of ragwort, or flying low over grass.

Cerigo cytherea (*matura*). Hartsholme; at sugar in July.

Luperina testacea. Hartsholme.

Mamestra brassicæ. Common.—*M. persicariæ*. Not common; have taken but two specimens of this moth.

Apamea basilinea. Lincoln; common at sugar.—*A. gemina*. Common at sugar. — *A. unanimis*. Common at sugar in 1892; not seen last year.—*A. oculea* (*didyma*). Common.

Miana strigilis. Very common; many handsome varieties. — *M. fasciuncula*. Common and various.—*M. literosa*. Rare.—*M. furuncula* (*bicoloria*). Rare.

Grammesia trilinea. Common at sugar in 1891; scarce since.

Caradrina morpheus. Lincoln; rare. — *C. cubicularis* (*quadripunctata*). Near Skegness; came rather freely to sugar in August.

Rusina tenebrosa. Lincoln; netted hovering over flowers of snowberry.

Agrotis valligera (*vestigialis*). Near Skegness; taken at sugar in August.—*A. suffusa*. Same time and place as preceding species. — *A. saucia*. Lincoln, &c. — *A. segetum*. Lincoln; very common near Skegness last August. — *A. exclamationis*. Common at sugar.—*A.*

corticea. Lincoln. — *A. tritici.* Lincoln ; not common. — *A. obelisca.* Lincoln, at sugar ; rare.—*A. porphyrea* (*strigula*). Lincoln, at sugar ; larvæ on heath in March and April.

Triphæna ianthina. Lincoln ; a few at sugar last year only. — *T. fimbria.* Lincoln and Skellingthorpe ; generally rare ; rather abundant last year.—*T. interjecta.* Hartsholme ; very rare.—*T. orbona* (*comes*). Common.—*T. pronuba.* Swarms at sugar.

Noctua augur. Lincoln, Hartsholme, &c. ; larvæ common on sallows in April, also on black currant and birch. Feeds at night.—*N. plecta.* Lincoln, &c., at sugar.—*N. c-nigrum.* Lincoln ; swarmed at sugar in August at Skegness.—*N. brunnea.* Hartsholme ; larvæ on sallows in April.—*N. rubi.* Lincoln ; Skegness.—*N. umbrosa.* Lincoln ; rather scarce. Netted flying over rough grasses. — *N. xanthographa.* Very common.

Trachea (*Panolis*) *piniperda.* Lincoln, at sallows and sugar, March and April ; larvæ feeding on Austrian pine.

Tæniocampa gothica, T. (*Pachnobia*) *rubricosa, T. instabilis* (*incerta*), *T. stabilis.* At sallow blossom and sugar.—*T. gracilis.* Rather rare, at sallow blossom.—*T. cruda.* Rather common, at sallows.

Orthosia upsilon. Lincoln ; rare. — *O. lota, O. macilenta.* Hartsholme ; a few at sugar each autumn.

Anchocelis rufina. Hartsholme and Skellingthorpe ; common last year at latter place.—*A. pistacina.* Common.—*A. litura.* Common.

Cerastis vaccinii. Abundant. *C. spadicea.* Common.

Scopelosoma satellitia. Common.

Xanthia citrago. Skellingthorpe ; not common. — *X. cerago.* At rest on sallows.—*X. silago.* On sallows and at sugar.—*X. ferruginea.* Common at sugar.

Euperia fulvago (*Cosmia paleacea*). Skellingthorpe.

Cosmia (*Calymnia*) *trapezina.* Common.

Dianthœcia capsophila, D. capsincola, D. cucubali. Lincoln ; rare.

Hecatera serena. Rather scarce.

Polia flavicincta. Not common.

Epunda nigra. Hartsholme ; scarce.

Miselia oxyacanthæ. Hartsholme ; common.

Agriopis aprilina. Common at Skellingthorpe.

Phlogophora meticulosa. Hartsholme ; rare. Swarmed at sugar near Skegness in August last.

Euplexia lucipara. Rather scarce.

Aplecta nebulosa. Hartsholme.

Hadena adusta. Rather common. — *H. protea.* Common. — *H dentina.* Scarce. — *H. oleracea.* Common. — *H. pisi.* Larvæ fairl common.—*H. thalassina.* Common.

Xylocampa lithorhiza (*areola*). Hartsholme.

Calocampa vetusta. Hartsholme ; only one specimen known.—*C. exoleta.* Common.

Cucullia umbratica. Hartsholme ; rather rare.

Anarta myrtilli. Hartsholme.

Heliodes arbuti (*Heliaca tenebrata*). Newball and Skellingthorpe.

Brephos parthenias. Hartsholme and Skellingthorpe.

Abrostola triplasia (*Habrostola tripartita*). Lincoln ; rare.

Plusia chrysitis. Common.—*P. festucæ.* Lincoln ; netted in June

Several fresh specimens at sugar near Skegness in August.—*P. iota.* Rather common.—*P. gamma.* Common.

Gonoptera libatrix. Rather common.

Amphipyra pyramidea. Hartsholme; one specimen, end of July. Afterwards found to be common at Skellingthorpe in August.—*A. tragopogonis.* Lincoln and Hartsholme.

Nænia (Mania) typica. Lincoln; common.

Mania maura. Hartsholme; rare.

Euclidia mi. Common in woods and on roadsides.—*E. glyphica.* Skellingthorpe; rare.

Lea Road, Wolverhampton.

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. de Vismes Kane, M.A., M.R.I.A., F.E.S.

(Continued from p. 212.)

LEUCANIIDÆ.

Leucania conigera, *Fb.*—Very widely distributed and numerous, but in my experience rather local. At Howth and Sligo, as well as the paler type, a more richly coloured form occurs,—var. *suffusa*, Tutt.

Leucania lithargyria, *Esp.* — Everywhere abundant. The varieties *pallida*, Tutt, and *ferrago*, Fab., occasionally occur. I have specimens of both from Lambay I., Co. Dublin.

Leucania extranea, *Gn.* — There is a damaged specimen of this rare insect in the collection of the Hon. R. E. Dillon, which he assures me was taken at Clonbrock, Co. Galway, on sugar, between the 20th and 25th July, 1891.

[*Leucania obsoleta* was inserted in Mr. Birchall's list in error.]

Leucania littoralis, *Curt.* — Very locally distributed round the Irish coast. Magilligan, rather abundant, Co. Derry (*C.*); Castlerock, Co. Antrim, (*Bw.*); Dollymount, near Dublin; Arklow and Courtown Harbour, Co. Wicklow (*Bw.*); near Glandore, Co. Cork (*D.*); Waterville, Co. Kerry, ab. The Irish specimens I have seen are but lightly shaded about the white central streak.

Leucania impudens, *Hb.* — "Abundant at Killarney" (*B.*). Mr. W. Salvage informs me that he has taken it freely at Mucross. One taken, in 1887, at Clonbrock, of a warm rufous tinge (*R. E. D.*).

Leucania comma, *L.*—Widely distributed, but I have never found it in any abundance in Ireland. Mr. Watts found it fairly common at Belfast. Our specimens are decidedly of a pale type, with the black lines not strongly marked. They often have a black dot at the end of the discoidal cellule (*nigropuncta*, Tutt). I have one dark example only (var. *suffusa*, Tutt), from Glandore, Co. Cork.

Leucania impura, *Hb.* — Very common throughout Ireland. Our specimens seem to correspond with the Scotch form, being pale in the fore wings and dark in the hind wings. I have seen none with more than three of the five black dots of Hübner's type developed; nor have I met with any of the reddish form, *punctina*, Haw.

Leucania pallens, *L.* — Also a very common insect. It is very variable in the colour of the fore wings. The reddest example I have seen is from Killynon, Co. Westmeath (*Miss R.*), and is almost of a brick-red.

Calamia lutosa, *Hb.*—I have no information of the occurrence of this species in Ireland from correspondents, excepting Mrs. Battersby, of Cromlyn, Co. Westmeath, who has a specimen which she believes was taken by her. Probably it is widely spread in Ireland, as I have taken it (one specimen) at Howth, Co. Dublin; and several at Markree, Co. Sligo; and Enniscoe, on the shore of L. Conn, in Mayo. They belong to the vars. *pilicornis*, Haw., and *cannæ*, Steph., being for the most part of a pale wainscot colour, and a few of a reddish ochreous, but all possessing a transverse series of dots.

Cœnobia rufa, *Haw.*—Mr. Birchall records Claring Bridge, Co. Galway, and Powerscourt, Co. Wicklow, as localities where it is common. Mr. Russ has found it near Sligo.

Tapinostola fulva, *Hb.* — Very widely spread through Ireland, and common in most marshy localities. Brick-red forms, with and without longitudinal shadings, occur near Derry, where Mr. Campbell has found the larvæ feeding in the roots of bog-cotton. The very white form, var. *pallida*, St., also is frequently met with. On the Oxhill range, Co. Sligo, *fulva* is extremely abundant; also Belfast (*W.*); near Donegal; at Armagh (*J.*); Counties of Monaghan, Tyrone, and Westmeath; at Howth; near Naas, Co. Kildare; and Dursey I., Co. Kerry, are among the localities where I have taken it.

Nonagria arundinis, *Fb.* — Very widely distributed throughout Ireland. I have rarely failed in finding the larvæ wherever the food-plant flourishes in any profusion. Those which I have bred are chiefly of the dark blackish brown form, *fraterna*, Tr., from the marshes on the coast of Wicklow, and from Glandore, Co. Cork (pupæ taken by Mr. Donovan). Near Naas, Co. Kildare, very abundant; also Shannon Harbour, near Banagher, Co. Tipperary; Markree, Co. Sligo; Enniscoe, Co. Mayo; Favour R[illegible]ugher, Co. Tyrone; Armagh (*J.*); Belfast (*Bw.*); near

Cork (*S.*); and Limerick (*N.*). Rats are very destructive of the larvæ and pupæ, gnawing the stems of the food-plant wherever the insect is abundant.

APAMEIDÆ.

GORTYNA OCHRACEA, *Hb.*—Probably much more widely distributed than the few localities I append would indicate. I have never taken the imago. "Common and widely distributed" (*B.*). Knocknarea, Co. Sligo (*Russ*); Greystones, Co. Wicklow; Clonbrock, Co. Galway, one (*R. E. D.*).

HYDRŒCIA NICTITANS, *Bork.*—The variations presented by this insect have been most minutely classified by Mr. Tutt, and the distribution of the three chief forms discussed. The segregation of the type and the var. *paludis*, Tutt, seems to me often to be so remarkable as to suggest a doubt whether they might not be distinct. I have not, however, found v. *lucens* thus supplanting the type in any locality, but occurring with it in more or less abundance, as on the Wicklow sandhills, whence Mr. Tutt records having received specimens from me. My information at present does not, however, tend to support his idea that v. *paludis* is "a marsh or coast form." Though Mr. Russ takes it exclusively at Knocknarea, Co. Sligo, the type and v. *lucens* are to be found about eight miles further up the coast, on the sandhills at Lissadell. On the east coast at Sutton, Co. Dublin; and on the long parallel ranges of sandhills and fens which border the Wicklow coast for many miles, from Wicklow to Newcastle and Kilcool, and again at Arklow, I have found typical *nictitans* to be the almost exclusive form, with a sprinkling of v. *lucens*, and out of a series sent to Mr. Tutt he only noted one v. *paludis*. On the other hand, I last year took long series of nothing but v. *paludis* (except two v. *lucens*) at the two inland localities of Clonbrock, Co. Galway, and Mote Park, Co. Roscommon. At the former demesne the insects occurred in a field subject to occasional floods; at the latter, in ordinary grass pasture land. At Favour Royal, Co. Tyrone, I had a similar experience, and at Ardtully, Co. Kerry. The distribution of these forms I therefore believe requires further careful investigation, as it is possible that only striking specimens have been collected, and not a fair average sample. Localities:—The insect is very abundant and widely distributed, but I have not noted its distribution in respect to variation till within the last few years. Besides the Dublin and Wicklow sandhills, where the type is small, dark red, or brownish, with broad, white (rarely orange), reniform stigmata, it occurs freely at Cromlyn, Co. Westmeath, where are wide areas of flat bog; as also at Enniscor, Co. Mayo; Killarney; Altadiawan, Co. Tyrone, amid the moorland; Lissadell, &c. Var. *lucens* occurs at Arklow and the Wicklow sandhills; Lissadell and Markree

Castle, Co. Sligo; Mote Park, Roscommon (*grisea*); and at Dursey I., off Co. Kerry. Var. *paludis*, as already given.

HYDRŒCIA MICACEA, *Esp.*—Very abundant everywhere, varying much in colour and size. In Donegal, Mr. Hart took a series averaging 1 in. 2 lines in expanse, a size which I have met with occasionally elsewhere, as at Howth, where the ab. *brunnea* occurs, which probably Mr. Dunlop mistook for *H. petasitis*. Mr. Tutt's vars. *lutea* and *grisea* also are taken with the type in various localities.

AXYLIA PUTRIS, *L.*—Widely spread, but somewhat local, and occasionally numerous. Derry, ab. (*C.*); Armagh (*J.*); Favour Royal, Tyrone; Drumreaske, Monaghan, scarce; Killynon (*Miss R.*) and Cromlyn (*Mrs. B.*), Co. Westmeath; Greystones, Co. Wicklow, ab.; abundant at Clonbrock (*R. E. D.*) and Kenryle, Co. Galway; Markree, and near Sligo (*Russ*), pretty abundant.

(To be continued.)

NOTES ON THE SYNONYMY OF NOCTUID MOTHS.

By ARTHUR G. BUTLER, Ph.D., F.L.S., &c.

(Continued from p. 217.)

DANDACA, *Walker.*

Steiria and *Minica*, Walk.

THIS genus consists of a few extremely variable species, identifiable most readily by the markings of the under surface of the wings; it is difficult to find two examples in which the pattern of the upper surface corresponds. The males have the antennæ finely and weakly ciliated, a slightly longer and more robust thorax than the females, and the frenulum and retinaculum slightly stronger.

Dandaca cuculloides.

♂ *Stictoptera cuculloides*, Guenée, Noct. 3, p. 52, n. 1383 (1852).
♀ *Steiria subobliqua*, Walker, Lep. Het. xiii. p. 1136, n. 1 (1857).
♂ *S. signifera*, Walker, *l. c.*, n. 2 (1857).
♀ *Minica confluens*, Walker, *l. c.*, p. 1140, n. 1 (1857).
♀ *Steiria humeralis*, Walker, Journ. Linn. Soc. vii. p. 174.
♀ *Briarda conturbata*, Walker, Proc. Nat. Hist. Soc. Glasgow, 1869, p. 354.
♂, ♀ *Steiria variabilis*, Moore, Descript. Ind. Lep. Atk. 2, p. 164 (1882).

Asia and Africa. In Coll. B. M.

To readily trace the modification of one variety of this species into another, it should be arranged thus:—*S. cuculloides*, *subobliqua*, *humeralis*, *conturbata*, *variabilis*, *confluens*, *signifera*. It is quite possible that *D. columba* may be another variety of the female; but as I have not hitherto seen links to connect it with the above series, I prefer, for the present, to regard it as possibly distinct. Mr. Hampson tells me that *Minica nigrilinea*, Walk., is a synonym of *S. subobliqua* (and therefore of *D. cuculloides*).

GRAMMODES, *Guen.*

Grammodes geometrica.

Noctua geometrica, Fabricius, Syst. Ent. p. 599, n. 37 (1775).
Phalæna ammonia, Cramer, Pap. Exot. 3, p. 98, pl. 250, D. (1782).
Noctua bifasciata, Petagna, Ins. p. 197 (1787).
N. chalciptera, Borkhausen, Eur. Schmett. 4, p. 771, n. 350.
N. parallelaria, Hübner, Eur. Schmett. Noct. pl. 66, fig. 324.
N. linearis, Hübner, Beitr. 2, pl. 4, T.
Grammodes congenita, Walker, Lep. Het. xiv. p. 1443, n. 7 (1857).
Europe, Asia, Africa, Australia. In B. M.

Considering how this unfortunate species has been burdened with names, it is remarkable how little it varies, the chief differences consisting in the width of the transverse white bands; if these differences were locally constant, they might have some value, but they are not. The Fabrician type evidently had the lower portion of the outer band suffused with brown, as in an Indian example in our series.

SYNEDA, *Guen.*

Syneda grandirena.

Phytometra grandirena, Haworth, Lep. Brit. p. 264.
Ædia limbolaris, Hübner, Exot. Schmett. Zutr. p. 23, n. 345, figs. 689, 690.
United States. In Coll. B. M.

Walker placed this species both under *Syneda* and *Grammodes*.

Syneda graphica.

Drasteria graphica, Hübner, Exot. Schmett. Zutr. figs. 11, 12.
Euclidia capiticola, Walker, Lep. Het. xiv p. 1461, n. 7 (1857).
United States. In Coll. B. M.

Several of the Californian species appear to me to run so close that, when they come to be bred, I fully expect they will prove to be no more than varieties of one another.

(To be continued.)

NOTES AND OBSERVATIONS.

The Oldest Name for Homopyralis tactus, *Grote*.—Prof. John B. Smith, in his excellent 'Catalogue of North American Noctuidæ,' has shown that Mr. Grote's name of *H. tactus* was superseded by Walker's name of *Homoptera zonata* in 1865, and earlier still by his *H. contracta*, published in 1860. Walker, however, described the same species still earlier; for, in his Catalogue, vol. xiii. p. 1073, n. 44 (1857), he called the same species *Homoptera quadrisignata*. It was in the same drawer with Walker's *H. zonata*; but, in consequence of its having no locality, was overlooked by Prof. Smith. Another very closely-allied species from Santarem stood next to *H. quadrisignata*; it only differs in having the post-median line of the primaries denticulated above (as well as below) the upper radial vein; and, in my opinion, is very doubtfully distinct. Should this one character prove as unimportant as one might expect it to be, the name of *H. dotata*, Walk., will take priority over all the others.—A. G. Butler; Natural History Museum.

Note on Coccyx ochsenheimeriana.—This species was first described as British by Mr. Barrett in 1878, from a specimen captured by Lord Walsingham among *Pinus cephalonica* at Merton, Norfolk (E. M. M. xv. 146). In 1885, Mr. Warren beat some specimens out of spruce fir at Brandon, Suffolk, about the middle of June, but these, with the exception of one fine female, were in bad condition. Mr. Boyd records one example from Waltham Cross, taken May 1st, 1893. I captured two specimens in 1893 at Pinner, Middlesex; one on May 22nd and one on June 3rd. This year I visited the same locality several times during May, but I only saw the species on one occasion, *viz.*, May 18th, when three specimens were taken between 4 and 5 o'clock in the afternoon. Probably *C. ochsenheimeriana* may be found among spruce fir in many other localities in Britain than those mentioned above, but our present knowledge of the distribution of the species in these islands is very limited.—Richard South; Oxford Road, Macclesfield, July, 1894.

Polyphagous Larvæ.—It may be useful and interesting to entomologists to know that I have this season found several species of insects in the larval stage to be very polyphagous. I had feeding at the same time, and in one large case, larvæ of *Saturnia carpini*, *Sphinx ligustri*, and *Attacus pernyi*, the Chinese oak-silkworm. The *S. carpini* larvæ were placed, on hatching, upon sprays of plum, upon which they fed until the second age; *S. ligustri*, similarly upon lilac; and *A. pernyi*, upon oak. Up to the second age they were separately confined within bags of book-muslin, upon their respective food-plants. They were then allowed the freedom of the case, each batch being placed upon its own food-plant apart from the others. I found, however, they all fed indiscriminately upon the several food-plants named above; and *S. carpini* from the third stage fed exclusively upon oak, by preference. *S. ligustri* also fed freely upon plum and oak; and *A. pernyi* seemed equally at home upon lilac.—T. J. W. Finch; Swindon.

Vanessa c-album.—I am very pleased to be able to prove beyond doubt that the dark form *is* the type of the first brood (in this district, at any rate), for I have to-day taken five specimens near here, all freshly emerged from the chrysalis, and not one of them were of the pale variety, which is typical of the first generation on the Continent. Two of the specimens captured were sitting upon their empty pupa-skins, so that it proves that the dark forms seen in the early summer are not all hybernated specimens.—W. HARCOURT BATH; Birmingham, July 14th, 1894.

"SMERINTHUS TILIÆ TWO WINTERS IN PUPA."—On May 2nd, two days after reading Mr. Claxton's note on the above (*ante*, p. 177), I had a fine dark female *S. tiliæ*, which had been in pupa since 1892. I have noticed that in most of these cases of retarded emergence, the moth proves to be of the female sex. Several pupæ of *D. vinula* and *S. carpini*, which I have had for three years, produced perfect insects last month, and all proved to be females. One expects the two latter moths to be erratic as to their duration of time in pupa, but I fancy it is of rare occurrence for *S. tiliæ* to pass two winters in that state.—N. F. SEARANCKE; Mitcheldean, Gloucester, June 17th, 1894.

PLUSIA FESTUCÆ DOUBLE-BROODED.—Is it generally known that this moth is double-brooded? The first brood appears here in June or July, and the second in August or September. Newman's account evidently mixes up the two broods.—J. ARKLE; Chester.

NYSSIA HISPIDARIA.—Which is the type,—for authorities differ upon the point,—the light or the dark form? I find the latter to be the type in Delamere Forest. Some of my correspondents have never seen the dark form, although well acquainted with the light one, which, by the way, also occurs sparingly in Delamere Forest.—J. ARKLE; Chester.

A NEW FOOD FOR EXOTIC SILK-PRODUCING LARVÆ.—No doubt students and breeders of the exotic silk-producing Bombyces will be glad to hear of a new stock-food upon which, I believe, all the species may be reared. I have been successful in rearing the following species, from the egg, upon the common wild apple, usually known as "crab-apple":—*Actias luna*, *Platysamia cecropia*, *Hyperchiria io* (American), *Saturnia pyri* (European), *Actias selene* (Indian). As is well known by all breeders, *A. luna* and *A. selene* are both walnut-feeders, and considerable trouble is often experienced in finding a suitable substitute where walnut cannot be obtained; with me the larvæ took to wild apple readily from the first.—T. J. W. FINCH; Swindon.

APHIDES AT TREACLE.—When visiting my "treacles" on Saturday last (July 7th), I found that they were simply smothered with Aphides, mostly of the green species; and that, not only on one, but on every tree I had treacled on the Saturday previous (June 30th). Coleoptera are of frequent occurrence, but I have never met with Aphides before; and I should like to know if any other entomologist has had a similar experience. My hunting-ground is that part of Epping Forest known as "Leyton Flats."—RICHARD W. TAYLOR; 36, Shacklewell Lane, Hackney, N.E., July 11th, 1894.

MR. WELLMAN'S COLLECTION.—Collections of Lepidoptera that find their way to the hammer are too often made up of so-called rarities and unique varieties gathered together regardless of cost, species now extinct and consequently eagerly sought after, and a mass of the commoner species in the most faded condition and utterly devoid of any data that might render them of interest. Mr. Wellman's collection, which was dispersed at Stevens' Auction Rooms on July 10th last, came under quite a different category; there were few rare or extinct species or remarkable varieties, but the rank and file of the collection were in unusually fresh and perfect order, and as a rule well localised, quite a history attaching to many of the series or individuals as the case might be; and the result of the sale—about two hundred pounds—appears to show that such conditions are appreciated by those who are willing to enrich their own collections on occasions of this kind. The contents of the three cabinets were divided into some 300 lots, of which the following were among the more interesting:—Lots 1 and 2, each containing five *Aporia cratægi*, with sundry *Papilio machaon*, *Leucophasia sinapis*, &c., brought 13/- and 12/- respectively. Lots 6 to 8, comprising seven each of *Melitæa aurinia* and *M. cinxia*, &c., went for 8/- to 10/- a lot; while an under-side variety of the latter species, figured in Newman's 'British Moths,' was knocked down for 32/6; and a specimen of *Vanessa antiopa*, taken on Clapham Common in 1873, was sold for 20/. Lots 18 to 20, which included the *Theclæ* and some well-marked forms of *Cœnonympha typhon*, realised 11/- to 17/- each; an "hermaphrodite" *Lycæna icarus*, taken by Mr. Wellman on Wandsworth Common in 1860, sold for 55/-; and two specimens of *Polyommatus dispar*, both minus antennæ, but otherwise in fair condition, for 40/- and 45/- respectively. Lots 26 to 28, each containing six *Lycæna arion* and sundry other Lycænidæ, ranged from 16/- to 20/- a lot; while *Deilephila galii* brought from 5/- to 7/-; *D. livornica* and *Chærocampa celerio*, from 10/- to 15/- apiece; and *Sesia sphegiformis*, 15/- to 17/- a pair. The other Sesiidæ, in lots of about thirty specimens, realised 11/- to 17/- per lot; while one containing a yellow-banded form of *S. myopiformis* reached 26/-. Twelve *Zygæna exulans*, arranged in three lots of four each, brought 13/-, 12/, and 14/- per lot; and an |V| variety of *Setina irrorella*, together with five *Nola centonalis*, &c., 50/-. Lots 62 and 63, each containing some fourteen *N. centonalis* and twelve *N. albulalis*, &c., were knocked down at 40/- and 55/- respectively. Lot 64, sixteen *Lithosia muscerda* and other species of the same genus at 32/6. Lot 65, eleven *L. caniola* at 30/-. An example of *Callimorpha dominula*, with hind wings of a somewhat orange-red, *Nemeophila plantaginis* var. *hospita*, and two not very striking varieties of *Arctia caia*, were the means of raising lot 70 to 50/-. Lot 71, which included three specimens of *Spilosoma mendica* var. *rustica*, and five buff-coloured *S. menthastri*, brought 22/-; while lot 72, in which there were two of each, realised only 10/-. Ten specimens of *Lælia cænosa* sold at an average of over 15/- each; and a couple of *Cleora viduaria* for 55/-. Lot 97, in which were included variable series of *Tephrosia biundularia* and *Gnophos obscuraria* brought 32/6; and lot 100, containing the remainder of the series of *G. obscurata*, the three *Boletobia fuliginaria*, recorded by Mr. Wellman in the earlier numbers of the 'Entomologist,' &c., 30/-. Four *Acidalia circellata* with other species of the genus, were sold for 16/-; while two other similar lots reached 20/- each. A specimen of *Acidalia herbariata* taken at rest on a shop window in Oxford Street in 1873, brought the lot in which it was included, together with *A. contiguaria*, &c., up to 37/6; while a similar lot, minus the *herbariata*, reached 16/– only. Nine fine specimens of *Acidalia strigilata*, together with *A. emutaria*, &c., were sold for 10/–; while the following lot, in which one of the *A. emutaria* was of a pinkish shade, and which included three *A. degeneraria*, one of them of a straw-colour, carried the bidding to 28/–; another lot, containing a fine series of thirteen of the last-named species, reached 16/–. An almost unicolorous brown variety of *Ematurga atomaria*, taken at a field meeting of the South London Society at Loughton, May 24th, 1884, sent lot 118 up to 21/–; four *Eupithecia ultimaria* having the same effect on lot 144; and a specimen of *Anticlea sinuata*, in which the white band was divided, carried lot 150 to 28/–. Fifteen bred *Camptogramma fluviata* and one *Phibalapteryx polygrammata* were the evident cause of lot 154 running up to 42/–; as were five fine dark-banded forms of *Eucosmia certata* of the following lot touching 22/–; three *Drepana sicula*, received from Mr. Grigg, of Bristol, sold for 16/–; and a pair of *Dicranura bicuspis*, from Mr. Tester, for 30/–; six *Bryophila muralis* var. *impar* brought an average of 4/– each; and two *Leucania albipuncta*, taken in the warren at Folkestone by Mr. Oldham, reached 35/–; six *Agrotis pyrophila* and five *A. ashworthii* realised 16/–; eight *Plusia chryson*, five *P. bractæa*, &c., 21/–; four *Toxocampa craccæ*, &c., 10/–; and so on.—Robert Adkin; Wellfield, Lewisham.

The United States Entomologist.—Prof. C. V. Riley having resigned the position of chief of the Department of Entomology in the United States of America, Prof. L. O. Howard has been appointed his successor.

CAPTURES AND FIELD REPORTS.

Sesia myopiformis at Kensington. — I have taken a specimen of *S. myopiformis* in the garden here. There is a pear-tree just on the other side of my boundary-wall, and the specimen may have come from it.—J. H. Leech; 29, Hyde Park Gate, S.W., July 10th, 1894.

Sesia conopiformis, a Species new to Britain.—Yesterday I met with a female specimen of *S. conopiformis*, Esp. (= *nomadæformis*, Lasp.); it was beaten from buckthorn. This species differs from *S. allantiformis* in having three instead of two yellow rings round the abdomen, and is most like *S. tipulæformis*, but in that species the tuft is unicolorous. A very distinguishing mark is—femora violaceo-nigra. Staudinger gives *S. conopiformis* as being found in Germany, Belgium, and France. — C. W. Dale; Glanvilles Wootton, July 20th, 1894.

Pieris daplidice in Surrey. — On Saturday, the 7th inst., I had the very good fortune to take a male specimen of the rare *Pieris daplidice* at Addington, near Croydon. It is a perfectly fresh specimen, and I think must have emerged from the chrysalis that very morning. — Norman H. Joy; Manor Road House, Beckenham, July 9th, 1894.

Pachetra leucophæa in Kent.—Whilst on a visit to Wye, Kent, I had the good fortune to capture five specimens of *Pachetra leucophæa*, one on the wing on the evening of June 3rd, and four at sugar on June 7th; three of these latter were very much worn. One of them, a female, I kept alive, and she has since laid about fifty or sixty eggs. Had the evenings been warmer and more suitable for sugaring, I should doubtless have taken many more specimens, but though I sugared regularly for eight nights, June 7th was the only one on which anything put in an appearance. I also took a good series of that very local insect, *Scoria dealbata*. My best thanks are due to Mr. G. Parry, of Canterbury, whose note on *P. leucophæa* (Entom. xxvi. 295) induced me to spend most of my holidays at Wye, and who very kindly met me on June 3rd, and showed me the localities for both *P. leucophæa* and *S. dealbata*, at the former of which (The Kneading Trough) a nephew of his who accompanied us caught a fine specimen of *P. leucophæa* at rest on a blade of grass.—Geo. Richardson; 19, Avondale Road, Peckham, S.E., June 21st, 1894.

Plusia moneta in Kent and Surrey. — I picked up a specimen of *Plusia moneta* on the staircase this morning when descending from my bedroom; it must have flown in to light during or between thunder rains. —Sydney Webb; Maidstone House, Dover, July 7th, 1894. On July 3rd I caught a specimen of *P. moneta* in the garden here.—D. P. Turner; Tonbridge. On the night of July 23rd, 1891, I took with the net a specimen of *P. moneta* in my garden. 1892 and 1893 passed without my taking another. But on June 30th this year I took a very fine specimen in my garden, and another on the night of July 3rd.—(Rev.) W. B. Money; Vigo House, Weybridge. This recent addition to the British Plusiidæ seems to have established itself in West Surrey. It has been recorded in the 'Entomologist' as captured at Albury and Dorking, 1893, with a further record for 1894. It has been taken at Weybridge in 1893 (one specimen), and in 1894, one at least; these have not been recorded. On July 20th a male was taken at Merrow, near Guildford, on white campion (*Lychnis vespertina*) at early dusk. It was sluggish on the wing, and easily captured. — (Rev.) L. Robert Flood; Merrow Rectory, Guildford, July 21st, 1894.

Pædisca rubiginosa and Butalis cicadella in Lancashire.—The former species has occurred on the high moors among Scotch fir; the specimens are larger than those from Scotland. I took a very fine example of *B. cicadella* near Fleetwood on June 15th; this species had previously only been taken by Messrs. Dunning and S. Stevens. The latter gentleman caught five specimens at Southend about forty years ago; one of them he sent to me, and it has enabled me to identify my recent capture, which I might otherwise have had some trouble in naming. — J. B. Hodgkinson; Preston, June 27th, 1894.

Sphinx pinastri in East Anglia.—It may interest some of your readers to know that three larvæ of *Sphinx pinastri* were taken by me last August and September in this neighbourhood. The larvæ were all found on the ground, just preparatory to going to earth, the time being shortly after midday in each case. The first was found Aug. 25th, a second on Aug. 27th, and a third on Sept. 6th. Two perfect specimens have emerged this year, one pupa not surviving the winter. The food-plant upon examination proved to be *Cedrus libani* and *C. deodara*, not *Pinus sylvestris*, which, I think, is more usual, though several of these latter trees stood quite near. I may also note that many instances of this moth being taken in the neighbourhood of Aldborough and Saxmundham have been recorded of late years, but specimens were taken by my brothers here one so early as 1875, and two more in the years 1876 and 1879 respectively. Since the latter date *S. pinastri* has not been taken in this neighbourhood until last year, when the larvæ were discovered. — A. P. Waller; Waldringfield, Woodbridge, Suffolk, June 27th, 1894.

Pterostoma palpina and Lithosia mesomella at Delamere Forest.—On July 22nd, 1893, I took two nearly full-fed larvæ of *P. palpina* off poplar. They pupated a day or two after. A fine imago (male) emerged May 31st. The only other record I can find for the district is "Puddington, 1 specimen" ('Macrolepidoptera of the Cheshire District,' by Alfred O. Walker). On June 16th, 1894, I found a fine fresh specimen of *L. mesomella* at rest on a birch-leaf close to the ground. Excepting the capture at Tan-y-Bwlch on June 9th, 1893 (Entom. xxvi. 289), I am not aware that this species has ever been previously taken in this district.—J. Arkle; 2, George Street, Chester.

Larva of Catephia alchymista.—On July 5th I went mothing with a friend in Abbot's Wood, near Eastbourne. We happened to shake an oak-bough on the chance of getting some larvæ, when down fell two larvæ, which to all appearances are those of *Catephia alchymista.* They were identified by Mr. Watkins, of Villa Sphinx, Eastbourne, who thought they were undoubtedly *C. alchymista.* They both spun up the next day, before I could carefully note the markings; but this is the description as far as I can remember:—In shape very much like *Catocala nupta;* colour reddish grey; ventral area bluish white, with a black spot on each segment, without legs or claspers; very conspicuous yellow collar; two small pyramidal humps on the fifth segment, and two slightly larger on the twelfth, covered with black hairs. Down each side was a row of small yellow warts, one on each segment, emitting one or two black hairs. The whole dorsal area speckled with minute black dots. *Calligenia miniata* was common in the wood, and *Argynnis aglaia* swarmed on Beachy Head. — H. W. Shepheard-Welwyn; Glenryde, Bidborough, near Tunbridge Wells, July 17th,

[The 5th of July seems to be exceptionally early for *C. alchymista* to pupate. On the Continent the larva is found from July to September. Our correspondent's description of the larva agrees in a striking manner with that given by Newman in 'British Moths,' p. 463.—Ed.]

SOCIETIES.

South London Entomological and Natural History Society.—*May 24th*, 1894. E. Step, Esq., President, in the chair. It was announced that Mr. T. W. Hall, F.E.S., had been elected a Vice-President in place of Mr. J. Jenner Weir. Mr. C. A. Briggs exhibited a variety of *Lycæna argiolus*, L., having several spots on the under side lengthened into streaks and some united; also a variety of *Vanessa io*, L., with the eye-spot only partially developed. Mr. Hall, a specimen of *Dicranura bicuspis*, Bork., with its cocoon, and remarked how closely the cocoon harmonised with the bark. Mr. Fremlin, a large number of bred aberrations of *Vanessa urticæ*, L., one series being of premature varieties; another showing variation in number and size of the characteristic spots in the centre of the fore wing, and ranging from only one spot present to four blotches; and a third series showed more or less suffusion of the orange coloration; one specimen was almost black. Mr. Dennis, a number of similar vars. of the same species, together with a specimen having a perfect and several with an imperfect band on the upper wing. Mr. Filer, a series of *Nyssia hispidaria*, Fb., taken in Epping Forest this year. Mr. R. Adkin, a long and variable series of *Boarmia cinctaria*, Schiff., bred from Co. Cork ova, one extreme form having only a broad marginal dark band, a central light band, and a basal dark patch; also living larvæ of the same species. Mr. Henderson, a specimen of *Macroglossa bombyliformis*, Och., taken at Brockenhurst during Whitsuntide. Mr. Billups, the following new and rare Diptera:— *Chortophila setaria*, Mg., from Dulwich; *Blepharoptera inscripta*, Mg., from Oxshott and Bromley; *Heteromyza atricornis*, Mg., from Oxshott; *Hypostena medorina*, Schnr., from Oxshott; *Sepsis punctum*, F., and *Callomyia amœna*, Mg., both from Bromley. Also, on behalf of Mr. Manger, a small collection of Australian Coleoptera and Homoptera. Mr. Hamm, a series of aberrant *Chrysophanus phlæas*, L., one example being intermediate between the type and var. *schmidtii*, Gerh.; a series of *Hybernia leucophæaria*, Schiff., showing extreme range of variation; a series of bred *Agrotis saucia*, Hb., all very light, and agreeing with the female parent; a striking var. of *Apamea unanimis*, Tr., having a light grey cloud extending from the apex of the fore wings along the hind and inner margins to the base; also a specimen of *Lithosia griseola*, Hb., of a brown instead of a leaden hue. Mr. Williams, a long bred series of *Pieris napi*, L., showing extreme variation, and read a short paper thereon. Mr. Sauze, insects taken at Seal Chart during the Society's Field Meeting on May 19th. Mr. Turner, two specimens of the rare homopteron, *Centrotus cornutus*, taken by Mr. Lewcock at the same place. Mr. Step read a paper entitled "Land Crabs."

June 14th.—The President in the chair. Mr. R. Adkin exhibited, on behalf of Mr. Tugwell, a series of varieties of *Spilosoma lubricipeda*, Esp., the product of a cross between var. *radiata* and var. *fasciata*, and read notes; three specimens of hybernated *Vanessa antiopa*, L., with pale margins, from Montreal, Canada; a series of *Asteroscopus nubeculosa*, Esp., bred from Rannoch ova, some of which had been in pupa three years; also bred specimens of *Aleucis pictaria*, Curt., from the New Forest. Mr. Frohawk, on behalf of Mr. Fremlin, a var. of *Apatura iris*, L., from Berlin, intermediate between the type and var. *iole*, Schiff.; on behalf of Mr. South, a dwarf captured specimen of *Euchloë cardamines*, L., measuring only 1¼ in. in expanse, and another specimen with the apical patch of two shades of yellow; also an ovum, *in situ* on a nettle-leaf, of *Vanessa c-album*, L., together with larvæ of the same species, showing all five stages of growth. Mr. Manger, a large collection of insects of all orders, captured on the steamship 'Kara' by Capt. T. Walker during a voyage to New York and Shanghai and back. It was interesting to note a specimen of *Acherontia atropos*, L., from Shanghai. Some species shown were new. A discussion ensued as to the distribution of species and the distances from land at which insects have been noticed. Mr. Edwards, specimens of *Papilio priamus* and *P. hewitsonii.* Mr. West (Greenwich), specimens of *Cryptocephalus nitidulus*, Gyll., and *C. coryli*, L., from Box Hill; also two very rosy males of *Smerinthus populi*, L., which had been attracted by a bred female. Mr. Filer, a long bred series of *Smerinthus populi*, L., among which was a male of the female coloration; one specimen had emerged in August of last year, and in this example the discoidal spot on the primaries was much smaller than in the rest of the brood, which went their usual period. Mr. Turner, a series of *Cymatophora ridens*, Fb., from the New Forest, a larva of the same species, and a pupa of *Melitæa aurinia*, Rott. The Report of the Field Meeting at Reigate was then read.

June 28*th.* — The President in the chair. Mr. G. A. Scorer was elected a member. Mr. C. Fenn exhibited a bred series of *Geometra papilionaria*, L., from one brood, of which some larvæ were not yet fully fed; a specimen of *Heliothis peltigera*, Schiff., having the blotch in the dark border of the hind wing very large; a very long series of *Selenia lunaria*, Schiff., showing spring, summer, and intermediate forms from one batch of ova; and a *Mantis* from Australia. Mr. R. Adkin, specimens taken during the Society's Field Meeting at Reigate, including the specimen of *Pachetra leucophæa*, View., previously reported, and vars. of *Lycæna icarus*, Rott., and *L. bellargus*, Rott. Mr. Dennis, ova and young larvæ of *Bombyx rubi*, L., from Reigate. Mr. Manger, a specimen of "British Coral," *Lepralis foliacea*, El. & Sol., taken from a portion of the French Atlantic Cable about sixty miles from Brest. Mr. Turner, a long series of *Lycæna bellargus*, Rott., from Box Hill, showing all the ordinary variations, some of the females having a considerable amount of the male coloration. A discussion took place as to the scarcity and lateness of insects this year, especially with regard to the Geometræ.

July 12*th.*—The President in the chair. Mr. R. Adkin exhibited a bred series of *Dianthœcia nana*, Rott., from Unst, all very dark and some unicolorous; and a yellow-banded var. of *Sesia myopiformis*, Bork., from Mr. Wellman's collection. Mr. Oldham, series of *Rumia cratægata*, D. L., including one with a very well developed waved line on all four wings; of *Noctua triangulum*, Hufn., and of *Dasychira pudibunda*, L.,—all bred this year, from Epping Forest; also insects taken at Wisley on July 7th. Mr. Dennis, varieties of *Epinephele ianira*, L., including a fine xanthic specimen. Mr. Auld, a long bred series of *Phorodesma smaragdaria*, Fb., from Essex, one specimen having only the discoidal spots present. Mr. C. A. Briggs, a specimen of the rare lacewing fly, *Nothochrysa capitata*, Fb., taken at Wisley. Mr. Edwards, two specimens of *Ornithoptera crœsus* from Batchian, *Papilio gyas* from India, and *P. electra.* Mr. Perks, the egg of a Coccinella deposited on the point of a thorn. Mr. Turner, series of *Lycæna minima*, Fues., from Galway, showing gradual diminution of spots on the under side; a brown-suffused var. of *L. astrarche*, Bgstr., from Reigate; and an asymmetrical var. of *Smerinthus tiliæ*, L. Mr. Turner read the Report of the Field Meeting on July 7th at Wisley, and Mr. Carrington made some remarks upon the scarcity of Lepidoptera in that district, and noted the abundance of Neuroptera.—Hy. J. Turner, *Hon. Report Sec.*

North London Natural History Society.—The annual excursion to the New Forest took place on Friday, May 11th, 1894. The party journeyed down, as usual, by the 5.50 p.m. train from Waterloo, and arrived at Lyndhurst about half-past nine. The gentlemen were quartered at No. 2, Lynwood, where the accommodation was in every way satisfactory; the ladies, under the charge of Mrs. Robbins, were at the Swiss Cottage. The weather during the journey was dull and often rainy. Saturday morning broke with a lowering and murky sky, and a north-east wind, but undeterred by these unpleasant weather prognostications, Messrs. Battley, Tremayne, and Nicholson put on mackintoshes and sallied forth to work the fences before breakfast. It immediately began to rain, but this had no effect on the lepidopterists, who, having finished their round, and only taken two *Melanippe fluctuata* and one *Eupithecia vulgata*, started larva-beating up Beechen Lane. The rain ceased for a time, and then came down harder than before. Off the very first oak Mr. Battley beat a young larva of *Agriopis aprilina*, and Mr. Tremayne subsequently beat another. Other larvæ beaten were *Oporabia dilutata*, *Hemithea strigata*, *Miselia oxyacanthæ* (some very nice lichen forms), *Himera pennaria*, *Hybernia defoliaria*, *H. aurantiaria*, *Phigalia pedaria*, *Nyssia hispidaria*, and *Calymnia trapezina*. *Asphalia ridens* was conspicuous by its absence; *Eupithecia abbreviata* was also not seen in the larval state, and all the larvæ were in a very backward condition. After breakfast, when the sun was shining brightly, the whole party started up Beechen Lane for Denny Wood. *Argynnis euphrosyne* was the first insect taken on the wing, and these were subsequently discovered to be out in fair numbers. So also was *Euchloë cardamines*, whilst hybernated *Gonopteryx rhamni* might be called plentiful. One or two eggs of the latter were found, but the buckthorn was not well advanced. The trees generally were fairly forward, except the oaks, amongst which there was a very vast difference, some of them being almost fully out, whilst others, perhaps close by, were only just shooting. The bracken was very low. More larva-beating took place, and the birch in particular was thrashed for larvæ of *Brephos parthenias* and *Asphalia flavicornis*; but although one or two small examples of the former were taken, the latter was not seen. As the members proceeded towards Denny, solitary specimens of *Lycæna argiolus* turned up in some numbers. Their condition was very variable, except the females, all of which appeared to be fresh. The same remark applied to *Pararge egeria*, which was also about. Scarcely any Geometræ appeared to be out. *Genista anglica*, on the well-known "Bombyx heath," was searched for larvæ of *Pseudoterpna pruinata*, but although two specimens turned up on the very first plant searched, no others were found. Messrs. Smith, Robbins, Battley, Harvey, and Woodward pushed on across Denny Bog to Stubby Copse, and succeeded in taking several specimens of *Macroglossa bombyliformis* by working along the railway line, where the insect was found last year. They also obtained *Syrichthus malvæ*, *Nisoniades tages*, and *Euclidia glyphica* in lovely condition, the colouring of the specimens being unusually fine. On Sunday morning Messrs. Smith, Tremayne, Robbins, Battley, Harvey, and Woodward worked through Holland's Wood to a spot where *Melitæa aurinia* is said to occur. This species was not seen, however, and was probably not out. A few specimens of *Nemeobius lucina* were taken, and one specimen of *Thecla rubi* by Mr. Battley. Dusking was tried in Beechen Lane and Whiteheath in the evening, but though several Geometers were about, the result was still unsatisfactory. Two specimens of *Ligdia adustata* were taken by Mr. Woodward, and *Pachycnemia hippocastanaria* was taken by several of the members. Subsequently the majority of the members, with the exception of Messrs. Tremayne, Battley, and Woodward, worked across the heath on to the Matley Road, the result being about forty specimens of *Scodiona belgiaria*. On Monday morning several of the members were out before breakfast. Mr. Battley obtained *Lobophora hexapterata* from the fences, and then unsuccessfully worked the heath on the Matley Road for *Scodiona belgiaria*, which he had failed to obtain the previous night. Subsequently, as he was returning *viâ* Beechen Lane, he beat a half-grown larva of *Apatura iris* off the very same sallow-bough from which he had obtained one two years before. Mr. Woodward succeeded in beating a couple of larvæ of *Thecla quercus*. After breakfast the whole party started for Rhinefield *viâ* Gritnam Wood. The usual Lepidoptera were about. Several specimens of *Lycæna argiolus* were taken, including females in good condition. And *P. egeria*, *G. rhamni*, *A. euphrosyne* in the wood, and *Ematurga atomaria* on the heath, occurred in its usual numbers. The rhododendron avenue was reached about midday, but the flowers, with only a few exceptions, were not yet out. Only one or two specimens of *Macroglossa fuciformis* were seen, but these appeared to be in perfect condition; the species was supposed to be just emerging. The party returned home *viâ* Hurst Wood, and left Lyndhurst about 7 o'clock that same evening, reaching Waterloo soon after 10 p.m. As regards Entomology, the backwardness of the season rendered the holiday less successful than in former years. Had Whitsuntide fallen later, collecting would doubtless have been much more profitable. As it was, except among the early butterflies, and one or two particular species, like *M. bombyliformis*, there was little work to be done by day; whilst, with the exception of *Scodiona belgiaria*, the absence of Geometræ rendered dusking an almost total failure. Sugar was not tried. But perhaps the party did more work in other branches of Natural History than has been done on previous occasions, and in any case the unanimous verdict of the members who attended the excursion was that the holiday thoroughly sustained its reputation of being one of the most enjoyable events in the "North London" year. — LAWRENCE J. TREMAYNE, *Hon. Secretary*.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*June* 18th, 1894. Mr. R. C. Bradley in the chair. Mr. C. F. Haines, of Stourbridge, and Mr. R. W. FitzGerald, of Uley, Dursley, Glos., were elected members of the Society. The insects captured on the Cotswolds during the recent visit of the Society were shown as follows:— Mr. R. C. Bradley, Lepidoptera and Diptera, &c.; the Lepidoptera included a specimen of *Thecla rubi*, with no trace of the white markings on the under side. There were many Diptera, including *Syrphus triangulifer*, an addition to our list, *Cheilosia chrysocoma*, *Brachyopa bicolor*, and other nice ones not as yet satisfactorily identified. Mr. C. J. Wainwright, Diptera only; these included *Syrphus annulipes*, Zett., new to our list, *Gymno-*

chæta viridis, and other Tachnidæ, and one or two doubtful insects, upon which he read a few notes. Mr. A. H. Martineau, Hymenoptera, including *Osmia xanthomelana*, *Andrena bucephala*, *Nomada ochrostoma*, a remarkably dark form of *Bombus muscorum*, &c. Other insects, Lepidoptera, &c., were shown by Messrs. A. W. Walker and W. Bowater. Mr. B. C. Rossiter exhibited a few Lepidoptera recently taken at Wyre Forest, *Chærocampa porcellus*, *Notodonta dictæa*, &c. Mr. C. J. Wainwright, a small box containing a few rare Diptera, including the three closely allied species of *Syrphus annulatus*, *S. vittiger*, and *S. lineola*, Zett.; the last species, the naming of which has been confirmed by Mr. G. H. Verrall, is a further addition to our British list of Syrphi. The box also contained one specimen of *Platychirus spathulatus*, Rnd., from Conway, a species just added to our list, on the strength of two specimens from Devonshire, by Mr. Verrall.—Colbran J. Wainwright, *Hon. Sec.*

Midland Railway Natural History Society.—*June 4th*, 1894. The second monthly meeting was held at the Midland Institute; Mr. T. Hey, President, in the chair. After the ordinary business of the meeting, Mr. F. W. G. Payne exhibited *Euchloë cardamines*, *Pieris napi*, *Spilosoma lubricipeda*, *Cilix spinula*, *Emmelesia albulata*, *Rumia cratægata*, *Abraxas ulmata*, captured near Derby. Mr. Hey, *Bombyx rubi*, bred from Bournemouth larvæ, *Cœnonympha pamphilus*, *Polyommatus phlæas*, *Heliodes arbuti*, taken near Ashchurch.

July 2nd.—The President in the chair. Captures were exhibited by Messrs. J. Hill, T. Hey, and F. Payne. Mr. Hill gave a practical demonstration of larva preserving and mounting, which was followed with great interest. The first field day was announced for Saturday, July 7th, to Whatstandwell.—F. W. G. Payne, *Hon. Assist. Sec.*

RECENT LITERATURE.

Abstract of Proceedings of the South London Entomological and Natural History Society for the years 1892 *and* 1893, *together with the Presidents' Addresses.* 8vo, pp. 160. Hibernia Chambers, London Bridge. 1894.

Whatever objection may be taken to the delay in publication, this Society is to be heartily congratulated on the production of a most interesting volume. In the Address for 1892 (C. G. Barrett) the subject of protective mimicry in Lepidoptera is treated in a lucid and instructive manner; whilst that for 1893 (J. J. Weir) deals almost entirely with Entomology and its pursuit, and includes valuable remarks on some important works published during the year. Only matters of more than passing interest have been abstracted from the Proceedings, and of the papers published the following are useful contributions to the subjects with which they deal:—"Remarks on *Pieris napi* and allied forms," "Notes on the wet and dry seasons' forms of certain species of Rhopalocera," and "Isochromatous Lepidoptera," by J. J. Weir; "Notes on the Cocoons of *Eriogaster lanestris*," and "My Summer Holiday," by R. Adkin; "Notes on the unusual abundance of *Polyommatus phlæas* in 1893," by F. W. Hawes.

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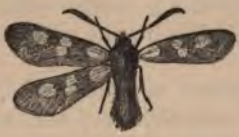
EDITORIAL.

WE are sure that our readers will be pleased to learn that Mr. W. F. Kirby, F.L.S., F.E.S., Assistant in Zool. Dept., British Museum (Nat. Hist.), S. Kensington, has consented to act on the Reference Committee of this Journal.

ABNORMAL EXAMPLE OF *ZYGÆNA TRIFOLII.*



THE extraordinary specimen of *Z. trifolii* figured above has been kindly lent by Mr. W. M. Christy, who took it on June 18th last in West Sussex.

On the right side the hind wing is entirely absent, whilst on the left side a wing similar in shape, colour and markings to the normal fore wing occupies the position of the ordinary hind wing. The right fore wing is not so well developed as that on the left.

In his letter accompanying this remarkable insect, Mr. Christy mentions that *Z. trifolii* did not occur this year in his district in anything like last year's numbers, and that eight or ten examples of an orange-red form were captured, but only four specimens of the yellow form were observed.

RICHARD SOUTH.

THE COPROPHAGOUS LAMELLICORNS; A REVISED LIST OF SPECIES BELONGING TO THE GENERA *PACHYLOMERUS*, KIRBY, AND *ATEUCHUS*, WEBER.

By John W. Shipp.

Assistant in the Hope Dept., Oxford University Museum.

The name *Scarabæus* was adopted by the ancients to denote the sacred beetle of the Egyptians, and is derived from the African word *Kephra*, meaning circle or cypher, and probably has reference to the round pellets of dung and mud which the beetles use for depositing their eggs. *Kephr* is probably the root-word, and is, according to Clarkson, analogous to the Greek word *Kapobos*, the Latin word *Scarabæus*, and the English word *crab*. The beetle was regarded by the ancient Egyptians to represent the sun, and as such was worshipped by them, and introduced into their hieroglyphical writings. Amulets—models of the beetle—carved both in wood and in a kind of soft stone, have been found in large numbers in the sarcophagi; most of those which have come under my notice were embalmed with the mummified body, and were covered on the flat side with hieroglyphics.

A specimen of *Ateuchus ægyptiorum*, Latr., was found in a sarcophagus which was opened a few years ago, but the metallic colour has slightly faded. It is thought by some entomologists that *A. sacer*, Linn., is the beetle which was worshipped by the Egyptians.

As the word *Scarabæus* was applied by Linnæus to represent the whole tribe of Lamellicorns, the name *Ateuchus*, Weber, should rightly be adopted for the genus instead of *Scarabæus*. In the Annals Soc. Ent. Belgique, xvii. Lansberge classifies the Scarabæidæ (Ateuchites) as follows:—

- Scarabæidæ
    - Ateuchides vrais
        - Ateuchides, s. s.
        - Eucranides
    - Canthonides
        - Canthonides vrais
        - Mentophilides
        - Epilissides
        - Epirhinides
    - Sisyphides

If the name *Scarabæus* is to be dropped in favour of *Ateuchus*, the primary division ought properly to be Ateuchidæ.

Burmeister (Stettiner Ent. Zeit. xxxiv. pp. 403—407), in a paper entitled "Lamellicornia Argentea," commences a revision of the Coprides of the La Plata, and divides the Scarabæidæ (Ateuchidæ) into four families:—1, Ateuchidæ; 2, Copridæ;

3, Onitidæ; 4, Onthophagidæ. The first of these he divides into—1, Eucraniidæ; 2, Coprobiidæ. I would, however, divide the Ateuchites with Burmeister, and the most natural divisions are to be found in the following table:—

- Ateuchites
  - i. Ateuchidæ
    - i. Ateuchinæ
      - Ateuchini
      - Eucraniini
    - ii. Canthoninæ
      - Canthonini
      - Mentophilini
      - Epilissini
      - Epirhinini
    - iii. Sisyphinæ
  - ii. Copriadæ
  - iii. Onitidæ
  - iv. Onthophagidæ

The first section (Ateuchini) contains the genera *Pachylomera*, *Ateuchus*, *Circellium*, *Sceliages*, and *Gymnopleurus*, which are furnished with wings, and have the sutures distinct.

I. Body winged, intermediate coxæ more or less separated, sutures always distinct, body more or less rounded, generally depressed above,* alike in both sexes. Antennæ 9-jointed.

A. Anterior legs destitute of tarsi; outer edge of the elytra smooth, not sinuate.

a. The apex of the four posterior tibiæ produced into a single spur.

aa. Anterior femora strongly swollen, toothed on the outer edges, and furnished with a strong spur or tooth on the under side in the males . . PACHYLOMERUS, Kirby.

bb. Anterior femora normal, without a spur on the under sides, in the males ATEUCHUS, Weber (SCARABÆUS). (Authors).

b. Apex of the intermediate tibiæ truncate, furnished with two small spurs; intermediate coxæ more separated; apex of posterior tibiæ truncate, and furnished with one spur.

aa. Metasternum smooth and flat, body subhemispherical, edge of clypeus with three indentations forming two small round teeth in centre; the four posterior legs are furnished on their edges with a number of small spines; anterior tibiæ shortish, furnished with three teeth on the outside edge . . . CIRCELLIUM, Latr.

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* Except in *Circellium*.

bb. Metasternum cuneiform (wedge-like); body much resembling *Ateuchus*; edge of clypeus furnished with six teeth, the two centre ones being produced, and having a semicircular indentation between them; anterior tibiæ longer, slender, curved inwards towards the apex, and furnished with four teeth on the outside edge . . . . Sceliages, Westw.

B. Anterior legs furnished with tarsi; metasternum cuneiform; outer edge of elytra sinuated laterally near the base . Gymnopleurus, Illig.

LAMELLICORNIA.

Tribe. Ateuchites.

Family. Ateuchidæ.

Subfamily. Ateuchinæ.

Section i. Ateuchini.

Genus 1. Pachylomerus, Kirby, Zool. Journ. iii. p. 520 (1828).

femoralis, Kirby, Zool. Journ. iii. p. 520, pl. xiv. f. 1 (1828); Bertolon, Nouv. Comment. Ac. Bonsu. x. p. 390 (1849).
horridus, Boheman, Ins. Caffr. ii. 2, p. 179 (1848).
opacus, Lansberge, Col. Hefte xii. p. 4.

Ethiopian Region. 1, 3. Caffraria; Trop. Africa; Cape Colony; Limpopo; Zambezi; Lake N'Gami; Matabili-land.

Pachylomerus was given by Kirby to a large species of *Ateuchus* with the anterior femora much swollen and dilated. Indeed, such gigantic femora seem quite out of place on the insect.

The male differs from the female in being furnished with a short stout spur on the under side of the anterior femora in the centre towards the outer margin. The females appear to have the under side of the anterior femora plain. The clypeus is divided into three lobes, the centre one of which is 4-toothed.

P. opacus, Lansberge, does not appear to differ from *femoralis*, Kirby, in any definite particulars.

The habits of *Pachylomerus* are similar to those of *Ateuchus*.

Genus 2. Ateuchus, Weber, Obs. Ent. p. 10 (1807).

Scarabæus, Linn., Syst. Nat. 12, ed. i. 2, p. 545 (1767).
Actinophorus, Creutzer, Ent. Vers. p. 79.
Heliocantharus, McLeay, Horæ Ent. ii. p. 497.
Sebasteos, Westwood, Trans. Ent. Soc. iv. p. 225.
Scarabæus, Panzer, McLeay, Mulsant, Harold, &c.

This is the *Scarabæus* of Linnæus and other authors. The species are peculiar to the Old World, and by far the greater proportion of the described species are found in the Ethiopian

Region, in the divisions 1, 2, 3, of Wallace. No species seem to occur in the 4th subregion, *viz.*, that of Madagascar, although it is not improbable that one or two of the numerous species which occur on the mainland may be also found on the island.

Æruginosus, *cupreus*, and *savignyi* are found in subregions 1, 3; *lamarki* in 1, 2; *morbillosus* in 2, 3; *isidis* occurs in the 1st subregion, and also in the Palæarctic subregion 2. The majority of species, however, are found in subregions 1 and 3.

The Palæarctic Region produced ten species, most of them being found in subregion 2, a few only being found in the 1st subregion; while in the 3rd subregion only *acuticollis*, Mots., and *sacer* var. *typhon*, Fisch., are found.

The Oriental Region produces *brahminus* and *gangeticus* from the 2nd subregion; *devotus*, *erichsoni*, and *sanctus* from the 1st. An undescribed species in the Hope Collection comes from Assam, in the 3rd subregion.

Ateuchus consists of species having the body rounded, generally depressed above alike in both sexes, antennæ 9-jointed, with a leaf-like club. The four posterior tibiæ are slender, elongate, not abnormally truncated or dilated at tips, obliquely truncated, and furnished with a single spur at the apex. The outer margin of the elytra is smooth. The clypeus is divided into three lobes, the outer edge being furnished with six teeth.

(To be continued.)

LIFE-HISTORY OF *VANESSA C-ALBUM.*

By F. W. Frohawk, F.E.S.

My success in working out and completing the life-history of this interesting butterfly this season is entirely due to the great kindness of Mrs. Hutchinson, of Leominster, who was good enough to send me a fine living female (the only specimen she knew of taken during the past spring), which I received on April 14th last.

On the following day, April 15th, I placed the butterfly upon a growing plant of stinging nettle (*Urtica dioica*), but both that day and the following were too dull to induce her to deposit. The morning of the 17th being brighter, I supplied her with sugar and water, which she imbibed apparently with great relish for ten or fifteen minutes, and enclosing her upon the plant, I placed it in the full sunshine. Upon examining the plant shortly afterwards, I was pleased to find a few eggs had been deposited, and by the afternoon I found twenty-three eggs were laid, the majority of them being upon the upper surface of the leaves, and as many as seven on one leaf, the others distributed over the plant, and a few upon the gauze covering. From that day until the morning of the 21st no eggs were laid, the weather remaining very dull, without a single gleam of sunshine; during those three days she remained perfectly still sitting head downwards, in which attitude I invariably found her while resting; on April 21st she again deposited. The following table of dates and number of eggs deposited may be of interest:—

			Number of eggs laid.
April	17th		23
,,	21st		few
,,	23rd		few
May	1st	65	several
,,	2nd		several
,,	5th		40
,,	10th		10
,,	11th		10
,,	13th		20
,,	14th		25
,,	17th		17
,,	18th	75	few
,,	18th to 24th		none during cold
,,	24th		25
,,	25th		16
June	1st		10
		Total	275

The female died on June 3rd, having lived in my possession for fifty days, during which time I fed her at frequent intervals, about every other day, according to the weather. From the above table it will be seen that forty was the greatest number of eggs deposited in a single day. Comparatively few were laid during the afternoon, the morning sun being the most suitable.

In the interesting letter from Mrs. Hutchinson received with the specimen, alluding to *V. c-album* she remarked, "They will sometimes lay as many as seventy or eighty eggs"; therefore, from the large number this particular female deposited, undoubtedly it was the full complement of eggs. The ova are laid singly, and principally on the upper surface of the leaf, and generally many upon one leaf.

The ovum measures in height $\frac{1}{32}$ in., is of an elongate spheroid form, smallest at the crown; there are either ten or eleven glassy white longitudinal keels which run from the crown to the base; they all commence at the edge of the operculum, leaving the central portion of the summit bare; they are highest at the commencement, decreasing in height as they descend and forming merely fine ribs after traversing the upper half, and finally disappearing on reaching the base; they have the appearance of fluted glass and are of a glistening whiteness; the spaces between the keels are slightly concaved, and very slightly ribbed transversely, only showing on that portion of the egg which is in high light. The colour is a clear green with whitish granulations, giving the appearance of a fine cellular pattern and appearing somewhat under the surface, and only visible on the shaded portion of the shell; the base is rounded and apparently smooth; the operculum is granular and slightly convex.

I examined a large number of eggs, and found the keels to be either ten or eleven in number, but eleven to be most frequent. The colour begins to change about four days before hatching, gradually turning more opaque and somewhat yellower, and showing a darkish blotch about the middle which slowly grows more distinct, and then the dark head of the larva appears visible under the surface of the crown; the egg then deepens into a dark grey-green, and finally the crown becomes black. The young larva makes its exit by eating away the operculum until the aperture is sufficiently large to allow its head to protrude, when it crawls very slowly out of the shell and at once creeps to the under surface of the leaf, and thereon spins a slight web and commences feeding.

On May 4th, larvæ began to hatch out from the eggs first deposited, having been about seventeen days in the egg. Directly after emergence the little larva measures $\frac{1}{12}$ in. in length. The body, legs, and claspers are of a pale ochreous tinged with green, especially on the anterior segments; the 4th, 6th, 8th, 10th and 11th segments are rather darker than the rest of the body, these five segments being of a rusty-brown hue, giving the larva a somewhat banded appearance; each segment consists of large swollen prominences, those on the dorsal surface being very large and elevated, those of the lateral region are more compressed; the dorsal pair on each segment are the largest, and from the apex of each rises a long gently curving hair tapering off into a very fine point; the sub-dorsal pair are conical in form and are united at their bases, and one placed slightly above the other, the lowest one being directly above the spiracle; both these terminate by a long hair, the upper one curving forwards and the lower one curving backwards; immediately below the spiracle is a double globular wart, the anterior portion bearing two hairs, one curving slightly forwards and downwards, the other directed backwards and downwards, the posterior half bears one hair which curves upwards and backwards. All the hairs are simple, finely pointed, and have bulbous bases excepting the dorsal ones; all are black with light tips. The claspers are very ample, and have two delicate whitish finely pointed spines, both directed downwards; the foot is black. The greater part of the surface of the larva has a granular effect, especially on the under surface, where it is clothed with extremely minute blackish points; the head is shining black and beset with hairs; the spiracles are black. When nine days old, and before the first moult, it measures $\frac{1}{8}$ in. long. The ground colour is clear brown inclining to ochreous (palest on the under surface), and chequered with dark-brown and white, and studded with black warts, each emitting a long hair as described above, but now all the hairs are stiffened and appear as fine bristles; the dorsal half of the 2nd, 3rd, 5th, 7th and 9th segments are white, also the greater part of the anal segment; the remaining segments are brown dorsally (appearing dark-brown from the presence of the black warts on the sienna-brown ground colour), which form a strong contrast with the white; the entire surface is particularly glossy, and the white resembling marble. The head, legs, and claspers remain unchanged.

The larva generally rests in a nearly straight position, but sometimes a good deal curved in the form of a fish-hook, but more often only slightly curved; it lives entirely upon the under surface of the leaf, and spins a fine layer of silk between the ribs upon which it rests. After each meal it turns round, and retracing its steps rests in the same place as before, and with its head furthermost from the part eaten; it feeds upon the spines, smaller ribs, and whole substance of the leaf excepting the largest mid-ribs, making large perforations in the leaf. During the act of defecation the larva elevates the posterior end, and, curving the anterior part of its body round, it takes the excrement in its mouth and jerks it away; if not successful in its first attempt to jerk it aside, it brushes it from its mouth with the long stiff dorsal hairs on the hinder segments.

Directly after emergence from the egg the larva, upon being touched, exudes a bead of greenish black fluid from its mouth, and remains immediately afterwards perfectly still, as if paralysed, but only for about fifteen or twenty seconds.

Since the hatching of the eggs the weather remained dull and cold, the average day temperature being only about 52°; therefore the growth of the larvæ during the first stage was undoubtedly considerably retarded. The first moult occurred on May 14th, when a large number moulted.

Before second moult the larva, when fourteen days old, measures $\frac{9}{40}$ in. in length, and rather stout in proportion; the ground colour is pale drab, shading into ivory-white on the lateral and under surface, chequered with brownish black; there are seven longitudinal rows of spines placed medio-dorsal, sub-dorsal, super-spiracular, and sub-spiracular, each spine terminating in a rather long finely-pointed bristle, and bearing other shorter and very fine bristles; all the spines are black, excepting those on the 5th, 7th, and 9th segments of the medio- and sub-dorsal rows, which are white, the white spreading over the dorsal surface of those segments, and is very conspicuous; the bases of the dorsal spines on the 2nd and 3rd segments, as well as the greater portion of the first and last segments, are of the same ivory-white colour ; there are no spines on the 1st segment ; the head is shining black, with two short blunt tubercles on the crown, one on each lobe, and emit a number of black bristles ; the surface of the head is scattered with numerous black hairs ; the legs are black and white, the claspers whitish with black extremities. They rest in the same attitude as in the previous stage, and always upon the under surface of the leaf.

Second moult, May 21st. After the second moult, twenty-six days old, it measures $\frac{7}{16}$ in. long ; the body is cylindrical and of uniform thickness throughout ; the ground colour is of a dark olive-brown, reticulated with white along the dorsal and sub-spiracular region ; the dorsal pair of spines on the 2nd and 3rd segments are amber-yellow, those on the 4th segment (where the medio-dorsal series commences) are all black ; the three dorsal spines of the 5th segment are paler yellow, and creamy white on the 7th, 9th, and 12th ; all are black on the 6th, 8th, 10th, and 11th segments ; all the spines are furnished with very finely pointed black spinelets ; the creamy white surrounding the bases of the white and pale amber spines form large conspicuous markings. All other details are similar to the previous stage, and their habits are the same.

Third moult, June 1st. Shortly before the fourth moult, and thirty-four days old, it measures, while extended, $\frac{8}{12}$ in. ; the ground colour is black, the 6th to 10th inclusive segments have the dorsal surface encircling the medio- and sub-dorsal spines of a milky white colour, the 11th segment has the anterior half white ; all the dorsal spines of the 2nd, 3rd, 4th, and 5th segments are amber-yellow ; all the super-spiracular spines are black, and are situated on amber-yellow crescentic markings ; those of the sub-spiracular series are greyish, and placed on a creamy-white streak ; a curved amber-yellow streak passes directly below the spiracles, which are outlined with whitish ; the body is encircled by two white lines at the segmental divisions, but those on the anterior part being pale yellow.

Fourth and last moult, June 8th. After fourth moult and fully grown, forty-five days old, it measures from $1\frac{1}{4}$ in. to $1\frac{3}{8}$ in. in length, when extended while crawling ; the body is almost uniform in thickness, the first and last segments only being the smallest ; each segment is much swollen round the middle, so that the larva has the appearance of being tightly girdled at the juncture of each segment ; there are seven longitudinal rows of spines from the 4th to 11th segments inclusive, which are situated in the following order : each having a medio-dorsal, sub-dorsal, super-spiracular, and sub-spiracular spine, the medio-dorsal spine being a little in advance of the rest ; the 2nd, 3rd, and 12th segments have each four spines ; all those on the 2nd, 3rd, 4th, and 5th are amber-yellow, excepting the sub-spiracular, which are white; all the other spines on the body are white, excepting the super-spiracular series, which are tinged with ochreous; all the spines are branched, each branch or spinelet is tipped with amber, and each spine also emits a number of very fine white hairs; the 1st segment is without spines, but has a transverse series of short and slender orange tubercles, each terminating by a fine pale hair curving forwards; the head in front is flattened and square, the lobes of the crown are swollen, and each surmounted by a short club-like knob directed forwards and outwards; upon the clubbed apex are five or six minute orange spines, each bearing a long fine amber-coloured hair; other similar spines are dotted over the face, the ground colour of the head is dull black, with a pale ochreous central Λ-shaped mark, and a short orange streak in front on each lobe of the crown. The ground colour of the body is black, reticulated with lilac-grey; the anterior half of the body is transversely ringed with amber-yellow at the segmental divisions, and those on the posterior half are white dorsally and yellow laterally; the greater part of the dorsal surface of the 2nd, 3rd, 4th, and 5th segments is amber-yellow; from the 6th to 10th segments inclusive have almost the whole of the dorsal surface white, with a short oblique black mark in front of each sub-dorsal spine, also a smaller black spot in front of the medio-dorsal spines, and a fainter one behind; the white surrounds the sub-dorsal spines, and is bordered below by velvety black, then by a rich deep orange wavy longitudinal super-spiracular band, and a similar but paler orange sub-spiracular band, both being united by an oblique narrow streak of deep orange, passing immediately behind the spiracles; on these bands are placed the spines; a short straw-yellow streak occurs anterior to and just above the claspers; at the base of each clasper is a row of four or five small orange warts, each bearing a fine white hair; the body has several minute warts sprinkled over the surface, each emitting a delicate white hair; the legs are shining black; the claspers grey at the base, shining black in the middle, with pale ochreous extremities. When about to suspend itself for pupation the white of the dorsal surface changes to a greyish hue.

The larvæ are gregarious, living generally in small companies, but sometimes many will crowd upon a certain leaf; their habits are similar in all stages, the usual resting attitude resembling the form of a fish-hook. The larva suspended itself for pupation on June 20th, and pupated the following day, the larval state lasting forty-seven days.

(To be continued.)

A CATALOGUE OF THE LEPIDOPTERA OF IRELAND.

By W. F. de Vismes Kane, M.A., M.R.I.A., F.E.S.

(Continued from p. 240.)

Xylophasia rurea, *Fb.*—Common everywhere. Irish specimens appear to be generally more marbled and brightly variegated than the common run of English. The type, with grey ground and dark markings, is not frequently met with (Howth, Kingstown, Drumreaske, Monaghan, and Sligo). Some examples have the ordinary markings very strongly contrasted with the pale ground colour, approaching forms from the Hebrides, in Mr. Barrett's collection; and others from Mr. Reid, of Aberdeen. The forms *ochrea*, *flavo-rufa*, and *intermedia*, of Tutt, are taken as aberrations in Ireland, the latter at Drumreaske. The var. *combusta* occurs very frequently with type, and seems distributed everywhere, and varies from a rich mahogany colour to a chocolate-brown, which latter is rare. Localities: abundant at Farnham, Co. Cavan, and Favour Royal, Tyrone; Drumreaske, Co. Monaghan, Armagh (*J.*); Markree and about Sligo; Clonbrock (*R. E. D.*) and Ardrahan, Co. Galway; Howth, Co. Dublin; Kenmare and Killarney, Co. Kerry. When compared with the ordinary Scandinavian form, we have in Ireland both the greyer type and much more richly variegated forms. Our var. *combusta* is identical.

Xylophasia lithoxylea, *Fb.*—Widely distributed and pretty common.

Xylophasia sublustris, *Esp.*—A local insect, and apparently more abundant in Connaught than the other provinces. The Irish moth is of a very ruddy tone, usually strongly marked with rust-coloured design, and belongs to Hübner's var. *lithoxylea*. Occasional specimens have the rust-coloured patches fainter; and Clonbrock produces the palest, and Banagher the ruddiest Irish examples that I know. Favour Royal, Co. Tyrone; Howth, Cabra a few (*C. G. B.*), Co. Dublin; Tinahely, Co. Wicklow, one (*Bw.*); Cromlyn (*Mrs. B.*) and Killynon (*Miss R.*), Co. Westmeath; near Banagher, King's Co., very abundant; Dromineer, Co. Tipperary, abundant; Claring Bridge, very abundant (*B.*); common at Clonbrock (*R. E. D.*) and Ardrahan (*Miss N.*), Co. Galway; Knocknarea, abundant (*Russ*), and Markree, Co. Sligo.

Xylophasia monoglypha, *Hufn.*—Universally common. The varieties presented by this insect do not appear to be topomorphic, with the exception mentioned below. A brightly variegated form, with a very black design on an almost white ground, is common at Kilcool, Co. Wicklow, and occurs at

Clonbrock, Co. Galway, Howth, Favour Royal, Co. Tyrone, and near Cavan. With it the var. *æthiops* and the greyish brown type also occur. The var. *brunnea* of Tutt is rare; I have seen specimens in the North and West, and in Co. Louth. The vars. *æthiops* and *infuscata* are widely spread over most parts of Ireland, with the type. The localities below refer to both, there being no distinctive character notable, except the comparative depth of colours. Common at Renvyle, Connemara; and Lambay I. near Howth; and not rare at Favour Royal, Co. Tyrone, and Castlebellingham, Co. Louth. Also at Derry (*C.*); Toberdaly and Banagher, King's Co.; Killynon, Westmeath; Magilligan, Co. Derry; Armagh (*J.*); Sligo and Markree Castle, occasional; and similarly throughout Cork and Kerry generally. The suffused brown form var. *obscura*, Tutt, is also widely distributed, and appears to be a local form on some of the rock islands off the Kerry coast.

XYLOPHASIA HEPATICA, *L.*, var. *characterea*, Hb.—Very local, and not numerous. The few Irish specimens taken up to the present seem referable exclusively to the rich liver-coloured mottled form. Powerscourt, Co. Wicklow (*Greene*); Kingstown, Co. Dublin, one specimen (*S. R. F.*); Farnham, Cavan; Favour Royal and Altadiawan, Co. Tyrone; and Roche's Point, Co. Cork.

DIPTERYGIA SCABRIUSCULA, *L.*—One at Clonbrock, Hon. R. Dillon.

CLOANTHA POLYODON, *Clerck.*—One at sugar, July, 1891, at Clonbrock, Co. Galway, by Hon. R. Dillon (Entom. xxvii. 170).

APOROPHYLA AUSTRALIS, *Bdv.*—Coast of Wicklow, and Waterford (Entom., 1872, p. 140). Sand-hills off Wexford Harbour, not scarce. Those I have taken at the latter locality are somewhat strongly marked with black.

NEURIA RETICULATA, *Vill.*—Local and scarce. One at Kingstown many years ago (*Greene*); one at Glandore (*D.*); three at Roche's Point, Co. Cork.

NEURONIA POPULARIS, *Fb.*—Generally distributed, and in some localities very abundant, as at Clonbrock, and on the Wicklow coast.

CHARÆAS GRAMINIS, *L.*—Universally common. Of the various aberrations described by Mr. Tutt, most occur sporadically throughout Ireland, including var. *hibernicus*, Curt., which, however, I have never seen. The most varied series I have met with was taken on the shores of L. Swilly, Co. Donegal, by my friend Geo. V. Hart, LL.D.

(To be continued.)

NOTES ON THE SYNONYMY OF NOCTUID MOTHS.

By Arthur G. Butler, Ph.D., F.L.S., &c.

(Continued from p. 241.)

Panula, *Guen.*

Panula inconstans.

Panula inconstans, Guenée, Noct. 3, p. 59, n. 1892 (1852).
Ophiusa narrans, Walker, Lep. Het. xiv. p. 1828 (1858).
Athymra tetragona, Walker, *l. c.*, Suppl. 3, p. 965 (1865).
St. Domingo, Honduras, and Jamaica. In B. M.

This moth is nearly allied to *Melipotis*, and varies even more than the species of that genus. In spite of Guenée's locality, I doubt its occurrence in North America; any way, the example labelled "*Panula inconstans*" in Grote's collection was *Melipotis cellaris*. Walker's *O. narrans* is typical *P. inconstans*, and of the same sex as Guenée's type. In view of the variability of this genus, I do not, for a moment, believe in the specific distinctness of the named forms of the allied genus *Synedoida*. Nevertheless, until proved to be mere sports of one variable species, I retain them under their distinctive names.

Homoptera vilis, Walk., appears to be a *Eubolina*.

Elousa, *Walk.*

Masebia, Walk.

Elousa albicans.

♀ *Elousa albicans*, Walker, Lep. Het. xiii. p. 1119, n. 1 (1857).
♂ *Erastria includens*, Walker, *l. c.*, xv. p. 1761 (1858).
♂ *Masebia famelica*, Walker, *l. c.*, xv. p. 1772, n. 1 (1858).
St. Domingo. In Coll. B. M.

In my opinion, *Homæa*, Guen., is best placed here.

Pantydia, *Guen.*

Pantydia sparsa.

Pantydia sparsa, Guenée, Noct. 2, p. 437, n. 1308 (1852).
P. recondita, Walker, Lep. Het. xiii. p. 1039, n. 3 (1857).
Toxocampa orthosiodes, Walker, *l. c.*, Suppl. 3, p. 873 (1865).
Australia generally. In Coll. B. M.

Pantydia metaspila.

Toxocampa metaspila, Walker, Lep. Het. xiii. p. 1032, n. 12 (1857).
Ophiusa pallidilinea, Walker, *l. c.*, xv. p. 1832 (1858).
Toxocampa moolla, Swinhoe, P. Z. S., 1885, p. 459, pl. xxvii., fig. 10.
Hypætra sordida, Butler, Trans. Ent. Soc., 1886, p. 414.
Ceylon, Poona, Java, Fiji. In Coll. B. M.

My determination of the genus of this species was nearer to the mark than either *Ophiusa* or *Toxocampa*; the latter is, of course, wildly incorrect, since *Toxocampa* belongs to the Trifidæ of Guenée. There is nothing whatever in *P. metaspila* to distinguish it from *Pantydia: Toxocampa atriplaga*, Walk., from Natal, must be referred to the same genus.

Walker's *Poaphila ingenua* (=*Phoberia atomaris*, Hübn.) and *P. porrigens* (=*basigutta*, =*Lyssia orthosioides*, Guen.) from the United States, which somewhat resemble *P. metaspila*, are species of *Ophisma* allied to the European *O. lunaris*, Schiff.

OPHYX, *Guen.*

Ophyx ochroptera.

Ophyx ochroptera, Guenée, Noct. 3, p. 234, n. 1644 (1852).
Ophisma resignans, Walker, Lep. Het. xiv. p. 1385, n. 36 (1857).
Moreton Bay. In Coll. B. M.

CELIPTERA, *Guen.*

Celiptera frustulum.

Celiptera frustulum, Guenée, Noct. 3, p. 308, n. 1767 (1852).
Litomitus elongatus, Grote (see Check-List, p. 41, n. 1260).
Remigia discissa, Walker, Lep. Het. Suppl. 3, p. 1009 (1865).
United States. In Coll. B. M.

In my opinion, Guenée's genus *Nymbis* cannot be very distant from *Celiptera*, and I fail to see how to distinguish it generically from *Phurys*; on the other hand, *Phurys helvina*, Guen., is a *Celiptera*, whilst *Nymbis iniqua* goes better with *Phurys*. The three genera are, I believe, only separable by pattern, for the relative lengths of the palpal joints will not separate them. In *N. iniqua* the third joint of the palpi in the male is as long as the second, and therefore does not bear out Guenée's character, "le troisième article moitié moins long que le second," which is only true of the female. Of course, *Phurys arcuata*, Walk., cannot be generically distinguished from *Nymbis textilis*, so far as can be judged from the figure of the latter species. I have therefore placed it, for the present, under that generic heading.

Celiptera optabilis.

Phurys optabilis, Walker, Lep. Het. xiv. p. 1485, n. 14 (1857).
Poaphila basilinea, Walker, Char. Het. Lep. p. 54, n. 91 (1869).
Honduras, Limas, Espiritu Sancto. Types in B. M.

This species is very suggestive of *Nymbis textilis*, but the arched second pale stripe, bounding the dark external area, is wanting.

Celiptera helvina.

Phurys helvina, Gueneé, Noct. 3, p. 307, n. 1765 (1852).
P. lineolaris, Walker (not Hübner), Lep. Het. xiv. p. 1483 n. 9 (1857).
Honduras and Bogota. In Coll. B. M.

Phurys glans, Grote, would stand better under this genus near *C. frustulum*.

POAPHILA, *Guen.*

Phurys. Guen.

In his description of *Phurys*, Guenée, comparing it with his genus *Poaphila*, says:—"Il est manifeste qu'ils doivent être séparés, et il est difficile d'expliquer pourquoi." Well, I agree with the latter part of the sentence, and I fail to follow the first part; therefore I sink *Phurys* as a worthless synonym. Under his first species, *P. vinculum*, Guenée himself says:—"Cette espèce lie le genre *Poaphila* et le genre *Phurys*." This should be conclusive!

(To be continued.)

ON THE LEPIDOPTEROUS GENUS *HEXERIS* OF GROTE.

By A. G. Butler, Ph.D.

Of this genus Grote says that it seems distantly related to *Syllectra*, and that in its colour and ornamentation it resembles some of the Geometridæ. He concludes that it is a Noctuid, on the ground that the lower radial of the primaries is given off near the posterior angle of the cell.

The fact that the lower radial is thus situated is so far from proving it a Noctuid, that (if it were sufficient of itself for that purpose) half the other families of moths might equally be called Noctuidæ.

Professor Smith, in his 'Catalogue of Noctuidæ,' includes the genus *Hexeris* (p. 376), and observes:—"A very distinct form, the type of which is in the British Museum. I had not seen it previously."

As a Noctuid it would indeed be a very distinct form; but as it is a Thyridid, and a very typical one, both in structure, colouring and pattern, one cannot regard it as "*very distinct*."

In Mr. Hampson's 'Fauna of British India, Moths,' vol. i., p. 352, the Thyrididæ are thus characterized:—"Moths generally with hyaline patches and striæ on the wings. Palpi obliquely upturned and slender. Antennæ almost simple. Fore wing with vein 1 *a* forming a fork with 1 *b* at base; 1 *c*, absent; 5 from near lower angle of cell. Hind wing with two internal veins; vein 8 nearly touching vein 7, just before or after end of the cell. Mid-tibia with a pair of spurs; hind tibiæ with two pairs."

These characters correspond in every respect with those of *Hexeris*, which belongs to the group having striated wings without hyaline patches. In its thickened antennæ and elongate palpi it approaches Walker's genus *Pharambara*.

NOTES AND OBSERVATIONS.

The Supposed New Species of Euchloë.—Regarding the description of the supposed new British butterfly *Euchloë hesperides*, Newnham, I should like to make a few remarks. I have noticed in a small series in my own collection that many of them differ (some rather considerably) in the shape of the discoidal spot, and also in the size of the orange patch in the males, but neither of these features seem in any way constant, except in the case of the small male and female captured at Kennington (Ent. Rec. v. p. 172), when the discoidal spot is extremely small. Again, in the males the apical blotch is very large and dark, but in the small female the blotch is very small, in fact almost obsolete, and of a grey colour. I stated that I believed that the small variety was called var. *turritis*, Ochs., on the Continent; this I have since verified, and also cannot find any distinguishing feature regarding the wing-scales. I am not prepared to assert that the small form is distinct enough to be considered as a distinct species, unless it is shown to differ in its earlier stages. Again, too much stress must not be made upon the orange spot, because this is certainly not a constant feature. The following note may explain something regarding the small variety (Entom. xiii. 189):—"With respect to *A. cardamines*, which is double-brooded on the hills which border the Garonne, at two leagues distance from the city. Collectors in Bordeaux despise the first brood, which appears in March and April, because it is smaller and less beautiful, and go in search of the specimens of the second brood, which are remarkable for their large size and brilliant colouring. . . . . . . The Bordeaux type of *A. cardamines* would not fail to pass as large and more brilliantly coloured than the specimens of the north, and nomenclators of varieties would not fail to christen it as perhaps *cardaminoides* (A. Wailly)."—John W. Shipp.

Papilio machaon Fourteen Months in Pupa.—I took two full-grown larvæ of *P. machaon* in one of the oases near Biskra (South Algeria) on April 11th, 1893; they pupated at once, and assumed different colours. One was of a brownish dead-grass tint, and from this a butterfly emerged in England on May 6th; the other was green, and did not produce a butterfly until June 9th, 1894.—W. M. Christy; Watergate, Emsworth, Hants.

A Puzzle.—On the 18th and 20th of July last I captured a couple of larvæ feeding on a species of *Aconitum* in a garden at Penzance: one, taken on the former date, was about half-fed, and was green, the intersections of the middle segments being whitish; the other, nearly full-fed, about an inch and three-quarters in length, was of a darker, more velvety green, the capital segment being also green; but both were evidently of the same species, as each rested with the anterior third of the body pressed against the middle third of the left side, a position reminding one somewhat of a hook. The younger larva I gave to my friend Mr. W. E. Baily; the larger one I brought home, when it *went to earth* on the 24th. I was inclined to think that these larvæ might pertain to *Plusia moneta*, as no other species, excepting *Plusia illustris*, that I am aware of, feeds upon monkshood; but subterranean pupation is certainly not the general habit of that species; so perhaps they may belong to some omnivorous Noctua which has accidentally taken to the unaccustomed plant; but, if so, why two of them, with evidences of their having been more! Should Mr. Baily's or my specimen yield forth its imago, you shall be duly advised of the occurrence.—H. Guard Knaggs; Camden Road, N.W., Aug. 13th, 1894.

Unusual Pairing of Lepidoptera.—When collecting in an oak wood a few miles from here, I saw a male *Argynnis paphia* in copulâ with a female *Thecla quercus*. I am sorry to say, that, though I secured the *paphia* the *T. quercus* escaped, as I wished to preserve the insects as they were.—Spotswood Graves; Tenby, July 21st, 1894.

[Other instances of unusual pairing have been recorded from time to time, among which may be cited the following:—*Attacus cecropia*, male, and *Sphinx ligustri*, female, Entom. xix. 136; *Tæniocampa stabilis*, male, and *T. gothica*, female, *Cerastis vaccinii*, male, and *Miselia oxyacanthæ*, female, *Euchloë cardamines*, male, and *Bapta temerata*, female, *Xylophasia monoglypha*, male, and *Hadena trifolii*, female, Entom. xxi. 158, 188, 282.—Ed.]

Abundance of Acidalia virgularia.—So numerous are the accounts that one hears of the scarcity of Lepidoptera this summer, that the occurrence of any species in profusion is quite a refreshing incident. Nor have our London gardens afforded an exception to the prevailing rule, and it is to such situations that I now more particularly refer. Many of our usually common species have been singularly scarce; *Spilosoma lubricipeda* and *S. menthastri*, *Mamestra brassicæ* and *M. persicariæ*, and *Euplexia lucipara*, have, at any rate, so far as concerns my own garden, been hardly seen; and even that essentially garden insect, *Melanippe fluctuata*, has certainly not exceeded its usual numbers. But to this dearth we have had one notable exception: *Acidalia virgularia* (*incanaria*) has been more or less common throughout the months of June and July, and during the latter half of the last-named month abundant, four or five being seen at rest on as many square feet of wall almost daily, and a tap on the Virginia-creepers or other sheltering foliage dislodging numbers of the insect. So rapid are the succession of broods of this species, that it is difficult to differentiate the spring and summer emergences with any degree of certainty; but there can, I think, be little doubt that the examples seen in the earlier part of June would be the true spring emergence, and that the larvæ resulting from it would have the advantage of the only really warm weather that we have had to complete their metamorphoses; and this may possibly account for the profusion of the later broods.—R. Adkin; Lewisham, August, 1894.

Note on Vanessa c-album.—In April last I caught an example of *V. c-album*, and finding it a poor specimen liberated it, and watched it hovering over a red currant bush in my garden here. On the last day of June I found a nearly full-grown caterpillar on that very bush, which, from the accurate description given in Newman's 'Moths and Butterflies,' I at once recognised as that of *V. c-album*. On July 3rd I discovered a chrysalis of this butterfly on the same bush, hanging in the orthodox way, *i. e.*, head downwards from a dead twig, and from this a dark coloured and very perfect specimen subsequently emerged. On Sunday, July 15th, my caterpillar, which had also turned into a chrysalis a few days after I took it, went through its last transformation, a fulvous yellow butterfly emerging.—W. P. J. Le Brocq; The Preparatory School, Brecon, July 24th, 1894.

Plusia festucæ.—This moth seems to vary in its economy in different localities. At Bolton, where I have taken it for many years, half-grown larvæ are found in April, and full-grown larvæ up to the middle of June; the food-plant is almost always the yellow iris. The pupa is generally in a bend of the iris leaf, about two inches from the point, and the moths begin to emerge at the end of June. I do not think a second brood occurs at Bolton; I and others have looked for it in vain. I never took the imago at Bolton, but at Galway last season (an exceptionally early season) I took one on May 28th and one Sept. 20th. I failed to find the larvæ on iris at Galway. Possibly in places where the iris flowers early the leaves may be too old for the larvæ to feed on, so that they are driven to find some other food-plant. At Galway the iris flowers in May, but at Bolton not till late in June.—J. E. R. Allen; The Grammar School, Galway, Aug. 15th, 1894.

Varieties of Zygæna pilosellæ and Bryophila muralis at Galway.—Among a large number of *Z. pilosellæ*, taken here last June, I have one of a yellow variety which occurs in some other species of the genus, the red on all the wings replaced by pale yellow. *B. muralis* is common here, and I have taken one curious specimen in which both wings on the left side have the colouring apparently only partially developed. The discoidal spot on the fore wing is present, and some of the black markings are abnormally large, but the green colour is scarcely perceptible, and the general appearance is rather that of an under side. The pupa had probably received some injury near the base of the wing-case immediately after casting the larval skin; the moth had the wings on the left side dislocated, and appeared unable to fly.—J. E. R. Allen.

CAPTURES AND FIELD REPORTS.

Dragonflies of the Vicinity of the Black Pond, Esher.—Although the early spring gave promise of a good dragonfly season in this neighbourhood, yet during the wet and cold weather of May and early June these sun-loving insects were scarcely to be found, and it is but lately that they have again appeared in any numbers. Since my last note (*ante*, 220) the following insects have to be recorded:—On June 17th a male *Sympetrum depressum* was taken, while on June 23rd *Agrion puella*, *A.* [*Enallagma*] *cyathigerum*, *A.* [*Pyrrhosoma*] *minium*, and a male and female *A.* [*P.*] *tenellum* were captured or seen. On July 25th dragonflies were fairly plentiful at the pond, and we noticed *Libellula quadrimaculata*; *A. puella* and *A.* [*P.*] *tenellum* in large numbers; and *L.* [*Sympetrum*] *scotica* in fair abundance. Our attention, however, was chiefly directed to *Anax formosus*, a male of which species fell to the lot of my companion. A few days later

(Aug. 4th) we again went in quest of this splendid dragonfly, and after a long morning's work my companion was a second time fortunate enough to secure a specimen—this time a female. On Aug. 7th we gave four or five hours' attention to *Anax*, and although many were seen, few came anywhere within striking distance, and but one, a fine female, was taken, that falling to my lot. On the same occasion *Æschna grandis* put in an appearance, but was wily enough to evade capture. — W. J. LUCAS, B.A.; 2, Gordon Road, Kingston-on-Thames, Aug. 8th, 1894.

ANAX FORMOSUS IN SURREY.—On July 25th last, while collecting in Claremont Woods, near Esher, Surrey, I had the good fortune to take a male specimen of the magnificent dragonfly, *Anax formosus*, which approached too near the edge of the pond, over which several other dragonflies, apparently of the same species, were flying. On August 4th, at the same place, after trying for a long time without success to capture another male, I with comparative ease took an example of the female. It unfortunately had its wings a little worn, but was otherwise a fine specimen.—J. S. BROCKLESBY; 17, Fairlawn Villas, Merton, Surrey, August, 1894.

PIERIS DAPLIDICE AT MARGATE.—As the practice of closely observing white butterflies on the chance of taking *P. daplidice* had been followed by me without success for a period exceeding forty years, there seemed little hope of my ever receiving a reward for my pains; but, *mirabile dictu*, whilst walking on the Margate Cliff on July 9th, a fine example of this beautiful insect passed before me almost at my feet, battling with the wind, and persistently chased by a male *P. napi*. Of its identity on the wing there could be no doubt, so clearly perceptible were its distinctive markings; for one instant, too, it settled, but alas! I was without net, and hesitated to use my head-gear, which probably would have spoiled the insect. The next moment the two butterflies disappeared over the cliff, and much I feared that the *daplidice* would be seen by me no more. I returned, however, to the spot in the afternoon, with the advantage of my net, but to my disadvantage the wind had increased in force, rendering the butterflies very wild. Amongst them I soon recognised my *daplidice*, which, after some futile efforts, I at last captured, and had the satisfaction to find a male specimen absolutely perfect. On the following day, in the same place, I took a beautiful female specimen, evidently fresh from the chrysalis. Squalls and storms supervened, with damage to Lepidoptera, and the only further record I have to report is that of the capture by my son, on July 15th, of a somewhat injured specimen, which serves as an inverted example.—SIDNEY COOPER; Hawkwood, Chingford, August 1st.

SMALL SPECIMENS OF EUCHLOË CARDAMINES.—On May 14th last I took on the wing, near Oxshott, Surrey, a very small specimen of *E. cardamines*, measuring (unset) 32 mm. (when set about 29 mm.) from tip to tip of the fore wings. As it answers exactly the general appearance of the supposed new species referred to in the 'Entomologist' for July (*ante*, p. 218), I thought it might be interesting to mention it. On April 3rd last a small female, 38 mm. in expanse when set, emerged in the breeding-cage, the larva from which it was bred having been taken in the same locality as the male noted above. About this larva I observed nothing exceptional, and the resulting pupa was small and of a very dingy pale yellowish green colour. If my memory serves me, the larva was rather scantily supplied with food, and this I took to be the reason for its small size, and concluded that the dwarfed proportions of the captured male might also be attributed to the same cause.—W. J. Lucas; 2, Gordon Road, Kingston-on-Thames, August 6th, 1894.

Argynnis paphia in Middlesex.—On July 31st, at four o'clock in the afternoon, a friend of mine, Mr. C. Ollett, of Wealdstone, caught a fine male specimen of *Argynnis paphia* on Stanmore Common. — C. Rhoades Smith; Station Road, Greenhill, Harrow.

Argynnis latona in Jersey.—On July 21st my brother, who is at school in Jersey, captured an example of *A. latona.* As I happened to be in the island at the time, I killed and set the specimen, and it is now in my possession.—J. M. Norman; 12, Church Road, Cauton, Cardiff, Aug. 2nd.

Vanessa polychloros in Devon.—On June 23rd I picked up a larva of this insect under an elm tree; it assumed the chrysalis state on July 3rd, and the perfect butterfly emerged on July 19th. The species is becoming rare in this district.—J. Buckland; Taunton, July 22nd, 1894.

Aberration of Polyommatus phlœas.—A very beautiful aberration of this pretty species was taken here in April last by Mr. Richmond. It has the costal margin of both fore wings, the outer margin of the right fore wing, and the marginal band on both hind wings white, the hind margin of the left fore wing being normal. It is therefore entirely bordered with white except this one margin, and has a very curious appearance. It was captured on the railway embankment, where the species is not uncommon. Mr. Richmond has most kindly given me the specimen.—John E. Robson; Hartlepool.

Acherontia atropos in Suffolk.—Whilst staying at Bramfield, near Halesworth, on July 16th, I was handed a good specimen of *Acherontia atropos*, caught in the early morning, on July 2nd, clinging to linen on a clothes-line. This had probably arrested its flight, and caused it to settle. —Claude A. Pyett; Thornley Place, Waterloo Road, Ipswich.

Plusia moneta in Norfolk.—I am pleased to record a capture of very great interest and rarity. The insect, which is a perfect specimen, is, on the authority of Mr. C. G. Barrett, undoubtedly *Plusia moneta*. It was taken by my younger brother at Sprowston, near Norwich, on June 26th, whilst hovering over the flowers of a large rose-bush, about 9.30 p.m.— F. C. Tillett; Sprowston Lodge, Norwich, July 25th, 1894.

Plusia moneta in Kent.—I have again taken a very fine female *Plusia moneta* (on July 16th) in the same garden near here, making now seven in all. I obtained some ova from this last one, but unfortunately they are infertile. — R. A. Dallas Beeching; 24, St. James Road, Tunbridge Wells.

Plutella cruciferarum.—This species seems to be fairly common on all the moors above the town. As a rule the moths do not fly until about 7 or 8 o'clock in the evening, but are freely disturbed from heather and bilberry by day. So far as I have had opportunity of observing the root-crops about this district, they seem to be free from attack, but I understand that the larva of *P. cruciferarum* (the diamond-back moth) is causing considerable damage to turnips, &c., in the East Riding of Yorkshire.—Richard South; Oxford Road, Macclesfield, Aug. 13th, 1894.

Aberration of Agrotis corticea.—The Rev. W. Claxton, of Hartley Wintney, Winchfield, has very kindly sent for inspection a curious variety of *A. corticea*, which he captured this year. The fore wings are dark smoky brown, with a pale brown spot before the orbicular, and another between the orbicular and reniform stigmata; the submarginal line is black, and the marginal area beyond this line is pale brown, giving the insect a remarkable appearance. The hind wings are fuliginous, with a bluish grey suffusion in certain lights; fringes greyish.

Cirrhœdia xerampelina in Ayrshire.—On Aug. 4th there emerged, in one of my breeding-cages, a specimen of this moth. Three larvæ were taken when beating blackthorn on April 20th, but as the branches of an ash-tree swept through the thorn-bushes, they in all probability came from those. Not knowing what the larvæ were, and supposing them to come from the thorn, they were, together with a number of larvæ of *Rumia luteolata*, fed on blackthorn, sallow, and wild apple, a sprig of each being always in the cage. They commenced to spin on May 5th, two between the moss and earth, the other among the leaves of the food-plant. In the case of the last one, the other larvæ devoured the leaves utilised before the cocoon was complete; the caterpillar thereafter falling to the bottom of the cage, made no attempt to again spin, but half-turned and died. One has attained the perfect state, as above stated; the other, I am afraid, has dried up. This species is, I believe, considered rare in the West of Scotland. Since the above was written, while sugaring some thistles in the evening of August 9th, a moth alighted on one adjoining; it was promptly bottled, and proved a rather worn specimen of *Plusia bractea*. *Nisoniades tages*, *Strenia clathrata*, and *Euclidia glyphica* were very plentiful here in May, but confined to one locality.—William C. S. Fergusson; Glencoy, Ayr, Aug. 10th, 1894.

Acentropus niveus abundant in Ireland.—In sunny calm weather *A. niveus* skimmed rapidly over the surface of the water, though appearing not to be the least affected when held under the water. All those which I took were obtained between July 10th and 20th. I found them mostly at rest, generally in pairs, on the blossoms of *Potamogeton*. They occur exclusively round the shores of the lake where this plant grows, and may be captured in large numbers.—Endymion Porter; Belleisle, Lisbellaw, Co. Fermanagh, August 15th, 1894. [The above is an extract from a letter received from Mr. Porter, to whom we are indebted for specimens of the insect referred to.—Ed.]

Pachetra leucophæa in Kent.—I beg to record the capture of *P. leucophæa* on June 16th at Wye. One female laid a fine lot of eggs in a diamond-shaped patch on the box; these hatched, but I turned out the larvæ, as I did not value them after reading certain remarks concerning the species. Two years ago I took a female at rest on the bank-side, three miles from Mr. Parry's famous locality, the Kneading Trough.—D. Chittenden; Wellesborough Lees, Ashford, Kent, August 11th, 1894.

A Proposed List of Derbyshire Macro-Lepidoptera.—I am, with the assistance of my entomological acquaintances, compiling a list of the Macro-Lepidoptera occurring in Derbyshire, and, to make the list as complete as possible, shall be greatly obliged if readers of the 'Entomologist' in the county would forward me lists of the species they have met with.

Any notes as to localities, rarity, &c., would be acceptable. — FRED. W. G. PAYNE; Hughenden House, Sale Street, Derby.

ODONTÆUS MOBILICORNIS AT SHIRLEY WARREN.—A female specimen of *O. mobilicornis* flew in to my study on the evening of July 27th, and was secured on my writing-table. This is a curious instance of history repeating itself, as my house is within forty yards of the house in which Dr. Sharp secured the specimen he records in the Ent. Mo. Mag. for July, on which occasion also I was present. I might mention that at the moment when the *Odontæus* flew round my lamp I was looking at a female oak-eggar moth, which had settled on the table. — H. S. GORHAM; Shirley Warren, Southampton.

ANOMMATUS 12-STRIATUS.—Now is the time to look for *Anommatus*, in the old skins of the rotten set of potatoes which are just being dug. As potato-growers know, the old potato, called the set, often rots away, leaving only a skin, with perhaps a little rotten matter adhering to it. In these cavernous retreats the *Anommatus* may be found; I have just taken as many as eleven from one potato. It occurs in other subterranean vegetable matter; I have just taken seven from one small carrot that was split and partly decayed by being eaten by slugs. And my son, Mr. H. M. Gorham, once found ten in a puff-ball; but there is no special predilection for fungi on the beetle's part.—H. S. GORHAM; August 18th, 1894.

PHOSPHÆNUS HEMIPTERUS NEAR SOUTHAMPTON.—I have never recorded the capture of a male of this insect at Swathling, near here, but I believe this the only instance of its occurrence, except at Lewes. I swept the example from a weedy bank, but could not obtain any others. This was on July 9th, 1891.—H. S. GORHAM; August 20th, 1894.

COLLECTING IN THE NEW FOREST, 1894.—I was staying at Brockenhurst from June 8th to 17th with Mr. R. Wilson. The weather was very dull, although we had very little rain. Of the Rhopalocera, *Argynnis euphrosyne* was most abundant, *A. selene* was only just coming out when we left, *Hesperia sylvanus*, *H. tages*, *Syrichthus alveolus* (common, including one variety), *Lycæna argiolus* (one battered specimen), *Gonopteryx rhamni*, *Euchloë cardamines*, *Vanessa cardui* (abundant), *V. polychloros* (one specimen), *Pararge egeria*. Of the Heterocera, *Macroglossa fuciformis* and *M. bombyliformis* flying over the rhododendrons at the Rhinefields, *Euthemonia russula*, *Lithosia aureola*, *L. rubricollis* (just coming out), *Bombyx rubi*, *Orgyia pudibunda*, *Euchelia jacobææ*, *Euclidia mi*, *Anarta myrtilli*. Of the Geometræ, *Aspilates strigillaria*, *Odontopera bidentata*, *Iodis lactearia*, *Corycia temerata*, *Macaria liturata*, *Panagra petraria*, *Fidonia atomaria*, *F. piniaria* (we beat the pine-trees for females, and got about a dozen; also one pupa of *Ellopia fasciaria*), *Ligdia adustata*, *Thera obeliscata*, *Cidaria corylata*, *C. russata*, *Larentia pectinitaria*, *Cabera pusaria*, *Melanippe montanata*, *Cleora glabraria*, *Tanagra chærophyllata*, *Ephyra punctaria*, *Venilia maculata*, *Anaitis plagiata*, *Boarmia consortaria*, *B. roboraria*, *Tephrosia crepuscularia*, *Melanthia ocellata*, *Eubolia palumbaria*. Larva-beating and searching were fairly productive; the most plentiful larva was that of *Vanessa polychloros*, of which we got about 150 off four trees; from a sallow a full-grown larva of *Apatura iris* fell into the beating-tray; the other larvæ being *Thecla quercus*, *T. betulæ*, *Argynnis paphia*, *Catocala sponsa*, *Tæniocampa miniosa* (off oak and bramble), *T. munda*, *T. stabilis*, *T. instabilis*, *Cosmia trapezina*, *C. diffinis*, *C. affinis*, *Cymatophora ridens* (abundant), *C. flavicornis*, *Bombyx neustria*, *Dicranura vinula*, *Notodonta ziczac*, *Liparis monacha*, *Trachea piniperda*, *Scopolosoma satellitia*, *Diloba cæruleocephala*, *Ennomos fuscantaria*, *Amphidasys prodromaria*. We sugared every night, and did fairly well on the whole, although on the first occasion we only got one moth, viz., *Agrotis exclamationis*. We took the following moths:—*Grammesia trilinea* (a long series, including many varieties), *Aplecta herbida* (abundant), *A. tincta*, *Hadena dentina*, *Rusina tenebrosa* (most of them between 1 and 2 a.m.), *Thyatira batis*, *Noctua plecta*, *N. brunnea*, *N. festiva*, *Miana strigilis*, *Leucania comma*, *L. turca*, *Phlogophora meticulosa*, *Xylophasia monoglypha*, *Agrotis exclamationis* (abundant), *A. segetum*, *Hadena thalassina*, *Triphæna pronuba*, *Boarmia consortaria*, *B. roboraria*, *B. repandata*, *Tephrosia extersaria* (very abundant), *Camptogramma bilineata*, *Larentia pectinitaria*, *Acronycta rumicis*, *A. psi*, *Ephyra omicronaria*, *Melanippe montanata*. On the wing in the evening we took *Metrocampa margaritaria* (abundant), *Ellopia fasciaria*, *Larentia pectinitaria*, and *Hepialus hectus*.—H. O. Wells; Hurstfield, The Avenue, Gipsy Hill, S.E., July 17th.

Below is a list of some of my captures during a week spent at the New Forest in July:—The Rhopalocera were fairly represented for the time of year. *Limenitis sibylla* and *Argynnis paphia* occurred in abundance on the bramble, while *Argynnis adippe* and *A. selene* were equally numerous on the thistle-grown railway banks. *A. aglaia* was taken singly, as were several newly emerged specimens of *Vanessa urticæ*, *V. polychloros*, *V. atalanta*, and *V. cardui*. *Lycæna ægon* was the only "blue" taken in profusion, while *Thecla rubi* was the sole representative of the "hairstreaks." *Rhodocera rhamni*, *Pararge egeria*, *Satyrus semele*, *Epinephele hyperanthes*, *Hesperia thaumas*, *H. sylvanus*, and *H. comma* also occurred plentifully. Tree-trunk searching produced *Ellopia fasciaria*, *Boarmia roboraria*, *Tephrosia crepuscularia*, *T. biundularia*, *T. extersaria*, *Ephyra trilinearia*, and several species of the genus *Acidalia*. The moths taken during the day were:—*Lithosia mesomella*, *L. rubricollis*, *Euthemonia russula*, *Scodiona belgiaria*, and *Tanagra chærophyllata*; while *Hepialus hectus*, *H. lupulinus*, *Metrocampa margaritaria*, *Pseudoterpna cytisaria*, *Phorodesma bajularia*, *Hemithea thymiaria*, *Melanthia albicillata* and *Cidaria fulvata* were netted at dusk. Sugaring produced *Nola strigula*, *Calligenia miniata*, *Boarmia repandata* (and the handsome black-banded variety), *B. roboraria* (eight specimens), *Gonophora derasa*, *Thyatira batis*, *Acronycta leporina*, *Leucania turca* and *L. lithargyria* (both plentifully), *Xylophasia hepatica*, *Grammesia trilinea*, *Triphæna subsequa* (six specimens); this capture was the more remarkable, as only two other examples of this insect were taken during the week, although about a dozen entomologists were sugaring in the same locality. Other insects taken were *Noctua plecta*, *N. triangulum*, *N. brunnea*, *N. festiva*, *Epunda viminalis*, *Aplecta herbida* (six specimens, rather worn), *A. nebulosa* (a perfect nuisance), and *Hadena thalassina*. Larva-beating was not very productive. *Liparis monacha* (just about to spin up), *Amphidasys prodromaria*, *Cymatophora ridens*, *Trachea piniperda*, and a single specimen of *Notodonta trepida* being the only larvæ taken.—W. Ilston Cox; 33, Muschamp Road, East Dulwich, S.E.

SOCIETIES.

South London Entomological and Natural History Society.—*July* 26*th*, 1894.—E. Step, Esq., President, in the chair. Mr. Frohawk exhibited a bred series of *Melitæa cinxia*, L., set to show the variation on the under side; one specimen had large oblong blotches in the light median band. Mr. Hall, a very variable series of *Melanippe hastata*, L., from Sheffield, Scotland, and the Hebrides, some specimens showing the median white band almost obliterated. Mr. Carpenter, a bleached var. of *Epinephele ianira*, L., from the New Forest, being the only insect captured worth recording during a fortnight's hard work; he stated sugar was an absolute failure. Mr. Robson, a series of *Macroglossa bombyliformis*, Och., taken on May 15th in the New Forest. A discussion ensued as to the presence of scales on the wings at emergence. Mr. R. Adkin, a series of *Coccyx strobilella*, L., together with the spruce-cones from which they had been reared, and read notes on the economy of the species. A discussion ensued. Mr. Auld, a bred series of *Calymnia affinis*, L., from Chattenden, and also a series of *Ephippiphora fœnella*, L., bred from mugwort roots, which were shown with pupa-cases *in situ*. Mr. Adkin read a communication from Mr. South, stating that the dipterous larvæ exhibited some months ago in the stems of *Arundo phragmites* had been found referable to *Lipara lucens*. Several members remarked upon the abundance of *Acidalia virgularia*, Hb. (*incanaria*, Hb.), and the scarcity of *Spilosoma menthastri*, Esp., *S. lubricipeda*, Esp., and *Euplexia lucipara*, L., while last year the reverse occurred.

August 9*th*.—The President in the chair. Mr. A. W. Peach, of Chiswick, was elected a member. Mr. Hall exhibited bred series of *Xanthia fulvago*, L. (*cerago*, Fb.), from Derby and Croydon, stating that it was usual to obtain more in proportion of var. *flavescens*, Esp., from the north than from the south; also bred series of *X. citrago*, L. Mr. West, of Streatham, two males and two females of *Lasiocampa quercifolia*, L., bred from larvæ obtained in the fen district. Mr. Adkin, on behalf of Mr. South, bred series of *Hypsipetes sordidata*, Fb. (*elutata*, Hb.), from Northwood, having very dark ground colour; bred series of *Cleoceris viminalis*, Fb., from Batchworth, some being melanic, while others were very pale; a few *Tortrix xylosteana*, L., of which one had jet-black markings instead of rich reddish brown; a long series of *Scoparia murana*, Curt., from Macclesfield; a series of *Prays curtisellus*, Don., comprising the normal and the uniformly fuscous form, collected round Macclesfield; and an exceptionally strongly marked female of *Hepialus humuli*, L., taken at Elstree. Mr. Croker, a long and fine series of *Leptogramma hastiana*, L., bred from St. Anne's-on-Sea; and two exceptionally distinct specimens of *L. literana*, L., from the New Forest. Mr. Adkin, a few specimens of *Spilosoma mendica*, Clerk., bred from Hartlepool; and three specimens of *Hylophila bicolorana*, Fues. (*quercana*, Schiff.), bred from New Forest larvæ, with the cocoons, upon the mechanical structure of which he made some remarks. Mr. Williams, a curiously scorched specimen of *Uropteryx sambucata*, Dup., from Highgate. Mr. Turner, a dark specimen of *Melanippe fluctuata*, L., referable to var. *neapolisata*, Mill., taken at Brockley.—Hy. J. Turner, *Hon. Report Sec.*

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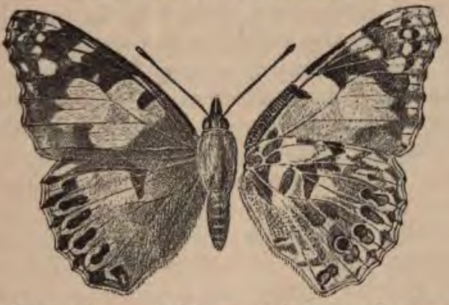
A VARIETY OF *VANESSA CARDUI.*



The fine aberration of *V. cardui* figured above differs very considerably from typical specimens of the species in the extent of markings on both surfaces of the wings, especially so on the secondaries. On the upper surface of the primaries the median band is almost obliterated, the black on the hind margin is paler and broader, extending further into the median interspaces, the apical markings are typical in form, but the black is reduced in depth, and the white spots are subdued, inclining to pinkish buff. The secondaries have the two submarginal rows of spots confluent, forming a series of conspicuous elongated marks, with the inner half of each centred with grey; the central portion of the wing is without markings; the ground colouring of both wings is normal. On the under surface the whole of the central and basal area of the primaries is without any trace of the usual markings, and the pattern of the secondaries is much modified and generally more suffused, and exhibiting an unusual amount of white over the basal half.

The specimen figured was captured on August 18th, 1892, at Hilmarton, N. Wilts, by the Rev. J. E. Tarbat, by whom it has been kindly lent me for figuring.

An aberration of *V. cardui*, somewhat similar to the above, is figured in the 'Entomologist,' vol. vi. p. 345.

F. W. Frohawk.

CHARÆAS GRAMINIS IN SOUTHERN SCOTLAND.

By Robert Service.

Under the expressive designation of "hill-grubs," the shepherds of the southern uplands of Scotland have been familiar for generations past with the larvæ of the antler moth as a most destructive pest, inferior in grass-eating powers only to those of rabbits, and, at rare intervals, to those of the short-tailed field vole. The details of the recent sudden outbreak of the last-named small rodents over the northern parts of the Border counties, and that so rapidly assumed the dimensions of a plague, rendering necessary a Government Commission of Inquiry, are quite familiar to naturalists. The only reason for mentioning the vole plague of 1891, 1892, 1893 here is to point out that it existed on practically the whole of the sheep-farm country that extends from Roxburghshire, along Tweedside, and the fine ranges of hills where the sources of the Esk, Annan, Nith, Urr, Dee, and Cree are found,—an old and historic land, full of the memories of Border raids and forays, and of the later Covenanting strife. And now the rolling green hills of Dumfriesshire, and the more rugged, and more heathery, steeper and more sterile, hills of Galloway are almost wholly given up to sheep and grouse, instead of being strongholds of the ancient fighting stock, which "made" so much history on both sides of the Debateable Land. Little more than a year has elapsed since the sheep-farmers congratulated themselves on having finally got rid of the voles that caused so much alarm and loss. During this spring and summer complaints have been many and deep of the widespread damage done by the "hill-grubs." So far as I can see and hear in the course of long rambles through the affected districts, the "hill-grubs," while present almost everywhere to the eyes of a close observer, have appeared to a really destructive extent only in somewhat isolated farms and patches. There is a badly affected area at the head of Eskdalemuir, and a second centre of destructive outbreak not far from Elvanfoot Station, on the Caledonian Railway, where the farms of Glengeith and Glenochar are specially badly infested. The lands around Leadhills and Wanlockhead—the highest-lying villages in Britain—have been sadly depreciated this season, owing to the ravages of these caterpillars. It was reported in the local newspaper, the 'Dumfries Courier,' that a travelling grocer, in going along the road between these two villages on June 22nd, drove over so many grubs that his cart-wheels were quite clogged and wet with the juice of their bodies. Passing over the country that lies between Queensberry and the head of the Glenkens, we come to a fourth affected area, on and around the head-waters of the Ken. The lands that intervene and connect these four different areas hold in the meantime a very much larger stock of *C. graminis* than is normally present, and if the present conditions of vigorous and progressive vitality continue over till another season, there is every reason to anticipate a plague of caterpillars as widespread and probably as destructive as the voles so lately were.

As I have already stated, the "hill-grubs" have been familiar to many generations of shepherds, and I have often been told by old men of outbreaks in different parts of the district that happened long ago. And for the most part these outbreaks appear to have been confined to certain localities or farms, and were but rarely general over a wider district in any particular year or years. The years from 1830 to 1836 were, however, remarkable for plagues of the "hill-grub." In these successive seasons the larvæ in question seem to have been spread over most of the southern uplands to a very destructive extent, and only recently I was speaking to an old herd who had seen the sheep-drains "chokeful," so that the water was dammed back by the masses of larvæ swept in by sudden thunder-showers. The same thing happened this summer, when, after the great thunderstorm on the evening of July 6th last, the drains and ditches on Polgowan farm, at the head of the Scaur water in Penpont parish, were found in many places to have been filled up by the grubs that had been washed in by the extraordinary heavy rainfall. Mr. Robert Martin, the tenant of the farm in question, informed me that in several of the hollows of the drains the larvæ were lying to a depth that was measured at 24 inches. Six to twelve inches deep of caterpillars was quite a common feature of this curious phenomenon. On June 18th a party of anglers fishing down the Ken from the Holm of Dalquhairn to a little past Craigengillan, a distance of several miles, found every trout they captured literally crammed to the mouth with "hill-grubs." Rooks are, as is well known, the great bird enemy of these caterpillars, and since the young broods were strong enough to accompany their parents to the hills, very large flocks of these birds have been in daily attendance on the grub-infected patches on many hillsides. The black-headed gulls (*Larus ridibundus*) and the common gulls (*L. canus*) are also very fond of these larvæ. Curlews take a good many, golden plovers and lapwings pick them up in numbers, and there is a little bird, the snow bunting, which one could hardly suspect of consuming these larvæ; yet nevertheless, in a lot of eight snow buntings shot in January some years ago on Crawfordmuir, I found an average of eight or nine undigested skins of *C. graminis* in each of their stomachs. Similarly in some other snow buntings, shot on a Galloway hill in midwinter, I found larvæ of *Noctua xanthographa*, showing, I think, that this bird does not always live on grass-seeds, as is so often stated. Whether any insect parasites limit the numbers of the "hill-grub," I am quite unaware, but I know that *Ichneumon latrator*, F., is often very abundant in places infested by *C. graminis*.

There seems to be an idea that the larvæ of *C. graminis* are unusually late this year, but I hardly think there is any ground for this belief. Until the notion was suggested by a correspondent, my belief was that the larvæ of *C. graminis* were really somewhat earlier than usual. Since early in June I have constantly seen these larvæ both at large amongst the herbage, and in numerous lots in boxes gathered and sent, or brought, to me for identification. In all cases there were larvæ in all stages, from quite small ones that had, so to speak, just emerged from the hybernating stage, right up to the large, sleek, and shining, fellows hard and wiry to the touch, that seemed about to undergo the perils of pupation. During the morning hours they seem to me to lie quiet, hidden low down amongst the culms of grass. By 10 or 11 o'clock they get on the move, and in places where they are abundant the sound they make in crawling through, amongst and over the grass-stems, some moving about, others munching their food, is very distinctly audible. To the eye the whole of the herbage seems in motion. This movement amongst the larvæ continues till late in the afternoon, when it quietens down to a very great extent. A friend of mine, who, towards the end of June, was walking along a moorland road in Carsphairn early in the afternoon, feeling a little fatigued, sat down for a rest against an overhanging bank that bounded the roadway. He had no sooner sat down than he became aware of a seething mass of caterpillars at the bottom of the bank, that was continually being added to by a constant dropping of individuals from the overhanging bank above. To confirm his observation my friend brought me a box containing several hundreds of these larvæ.

When at large the larvæ like best to feed on that portion of the grass-stems that grows at the level of the ground. The voles fed very much on the same part of the grass. And in both instances the stems and general masses, becoming thus detached, got blown away in bunches and swathes of brown withered hay, giving the knolls and hillsides a bare and desolate appearance that can be detected at a great distance away. The species of grass and other plants that are most affected are deer's hair (*Scirpus cæspitosus*), spret (*Juncus articulatus*), bent grass (*Agrostis vulgaris*), blaw grass (*Molinia cærulea*), wire bent grass (*Nardus stricta*), hair grass (*Aira cæspitosa*), rough-stalked meadow grass (*Poa trivialis*), midge grass (*Holcus lanatus*), cotton grass (*Eriophorum vaginatum*), stool bent (*Juncus squarrosus*). Although I give these as the kinds of grass usually eaten, I question very much whether the larvæ have really any marked preferences, for wherever the bare patches of grub-infested pasture are seen, it will be found that *all* the grasses have gone quite indiscriminately. I have not been so fortunate as to see the morning flight described by Mr. Wailes, and so often quoted in connection with this species. On the evening of the last day of September, 1893, I happened to be coming down with a companion from the wild mountains around Loch Dungeon, where I had spent a very pleasant day. The evening was mild and very moist—what we call "mochy" hereabouts—and just as we got on to the level ground at the outside of a moss of perhaps six acres in extent, we found antler moths flying in countless myriads in every direction. The time was 6.40, and there was still enough of the gloaming left to see the moths quite distinctly on every side of us, flying just below the level of the grass-seed heads. How long this flight had already lasted we had no means of knowing, and as we had many miles of the roughest knowes and bogs still to traverse before we would reach our destination for the night, we tarried only long enough to capture a few specimens for the sake of date and locality. Some years ago, when I was in the habit of going to a railway signal-box in this neighbourhood, where I had secured special permission to capture insects at the lamps, I used to find *C. graminis* very commonly, but it never came into the lighted cabin until after 11 o'clock. The time used to be distinctly noted from the fact that there appeared, on favourable nights, to be always a rush of moths immediately after the passage of an express train that passed the cabin at 11.5. During the autumn months this species is very frequently found during the daytime on thistle and ragweed flowers. On the moorlands the larvæ seem to have a liking for pupating under stones. Small stones, not much bigger than the outspread hand, and lying partly buried in the soil, will, in favourable spots, be found to have one or more pupæ underneath. I have frequently gathered the pupæ in such places.

In confinement the larvæ of *C. graminis* have (with me, at any rate) thriven very badly, and scarcely five per cent. have got to the pupal stage. Several of my friends have the same complaint to make. The caterpillars reach the last moult and die off, their bodies being then in an almost fluid condition. I have tried them in several ways, even going to the trouble of bringing some sods of the moor grasses, but with no better success.

There is a tolerably frequent remark that these larvæ "follow the voles." It is of course well known that after the vole plague suddenly ceased the pasture sprung up again in the most luxuriant manner. The tussocks of coarse perennial grasses, the rushes and sedges, had all disappeared, and the new grass was young and green, and of the freshest description. Whether the "hill-grubs" were thus furnished with suitable pabulum on which to increase and multiply and devour the earth, is a question worth discussing, and that some observers think might be answered in the affirmative. So far as my humble opinion is worth anything, I incline to the belief that the respective outbreaks of the voles and the "hill-grubs" have no connection other than in some little-understood climatic conditions.

Maxwelltown, Dumfries, July 17th, 1894.

PS.—On August 23rd I happened to be going across the farm of Townhead, in Closeburn parish, Dumfriesshire, with some friends, who, like myself, were at the time occupied in some archæological researches. I had been on the moor perhaps half an hour or so, without any particular thought of Entomology, when all at once, about 10.10 a.m., the antler moths appeared in myriads. Thousands upon thousands of them were flying in all directions, most of them just amongst and over the flowering heads of the spret (*Juncus articulatus*); but many were flying higher in the air, and some mounted up out of sight. It was a wonderful scene, and one that I would not have cared to miss. The effect was altogether different to that presented by the evening flight I saw near Loch Dungeon, described above. On that occasion the range of vision was circumscribed to a circle of a few yards by the gathering gloom of a dull autumn night, and the moths might not have been noticed at all by those unaccustomed to observation. But the sight of such vast numbers of moths in broad sunlight was something entirely novel, and so unexpected that I could not help gazing on it in wonder and amazement. The thickest of the flight was over places where the spret grew almost to the exclusion of everything else. About 12 o'clock the moths became much fewer, but during the whole afternoon there were more or less always to be seen flying about. Near 7 o'clock in the evening, when I left the hillside, they were again becoming more plentiful. A somewhat remarkable thing is that the "hill-grubs" were not noticed to a destructive extent on this farm.

September 8th.

THE NORTH AMERICAN NOCTUIDÆ OF THE GENUS *INGURA*.

By A. G. Butler, Ph.D.

Having recently had occasion to examine the species of *Ingura*, and wishing to see whether Prof. Smith had included in his synonymy an insect of that genus described by Walker under the genus *Subrita*, I was convinced that this author could not have examined the drawers of our arranged collection containing *Ingura*; inasmuch as, not only his synonymy, but his remark respecting at least one species (in that drawer) of which we possess the type, clearly prove that the genus, as arranged by me, cannot have been even glanced at.

The genus *Ingura* has been arranged in the Museum collection for quite a considerable time, for it is one of the groups which years ago I referred to the Notodontidæ, only discovering my error when engaged upon the arrangement of the Noctuidæ, to which group I immediately transferred it.*

I have nothing to add to Prof. Smith's notes respecting *I. declinata*, Grote, *I. delineata*, Abbot, and *I. abrostoloides*, Guenée. If I have seen Abbot's drawing, it is evident that I have failed to identify the species.

I. FUSCESCENS, *Walk.*

This is not a North American species; the type was from Honduras, and is a very slight variety, scarcely worth noting, of *I. lunodes*. It is very distinct indeed from

I. ABROSTOLELLA, *Walk.*

Incorrectly spelt *I. abrostella* (sic) by Prof. Smith. It would be a pity if we had to adopt the name in a genus which already contains a species named *I. abrostoloides*. Fortunately this will, I feel certain, be unnecessary. Respecting *I. flabella*, Grote, and *I. oculatrix*, Guen., I have nothing to add to Prof. Smith's remarks.

I. PYGMÆA, *Hübn.*

I have no doubt that this is a bad representation of *I. abrostolella*, the synonymy of which therefore will be as follows:—

Ingura pygmæa.

Pæctes pygmæa, Hübner, Exot. Schmett. Zutr. 21, figs. 109, 110 (1818).
Subrita? abrostolella, Walker, Lep. Het. xxxv. p. 1744 (1866).
Ingura præpilata, Grote, Bull. Buff. Soc. Nat. Sci. ii. p. 311 (1875).

I. CRISTATRIX, *Gn.*

This is a truly Indian species, the type of which, from Horsfield's Java collection, is in the Museum. Its range extends into Southern India on the one hand, and to the Friendly Islands on the other. It differs from all the American species subgenerically, the basal portion of the antennæ being strongly and widely pectinated, the pectinations not appressed to the shaft, but expanded freely. There are four examples of this well-marked species in our drawer of *Ingura*, and it is so conspicuous an insect that no man looking into the drawer could fail to be struck with it. I would propose for this form the subgeneric name of *Callingura*. To some men it will be a genus; but as it is only distinguishable by secondary sexual characters of the male, it ought to take a lower rank than a group in which distinctive structural characters occur in both sexes. Mr. Hampson regards *I. cristatrix* merely as section B. of *Ingura*, and therefore does not name it. I think names for these subgenera or sections are a great convenience.

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* I am not positive that this genus stood among the Noctuidæ when Prof. Smith went through them; but it was arranged, and all the species labelled.

I offer these notes, not as a criticism of Prof. Smith's work, but merely as a contribution towards a correct knowledge of North American Lepidoptera. I trust, therefore, that this author, who has done more good work in the group than any of his predecessors, will accept the corrections in the same scientific spirit which prompts me to publish them.

SOME INMATES OF A DECAYED CHERRY-TREE.

By C. J. Watkins.

Twenty years ago, on this tree in our garden here, at the bottom of a Coteswold valley, I used to hang saccharine snares to attract the sweet-loving Lepidoptera. Some time after it was struck by lightning, and soon showed signs of decay. The limbs broke off in the severe gales which occasionally visit us, and for several years the old stump, some 7 ft. high and 10 in. diameter at its base, supported a metal clothes'-line. For the past three years signs of internal feeders have increased in the quantity of woody *débris* ejected from some holes in the bark, and, falling on a bed of marjoram growing round the base of the stump, formed a striking contrast to the colour of the herb. Several times I had watched the holes, hoping to see some inhabitant passing in or out, but without success, till Oct. 23rd, 1892, when at midday, in the sun, a *Pemphredon* appeared and entered one of the burrows. Never having examined the nidus of a fossore, I greatly desired to have the stump removed indoors for careful examination during the winter, but business and ill-health prevented this project being carried out. During March, 1893, the top portion broke off in a high wind, and disclosed such an assemblage of burrows and galleries occupied by insects in various stages of their economy, that I had the old stump cut down, and, after sawing it into suitable blocks, divided each block into portions, placing them in large glass-topped cases, while special pieces were kept in smaller boxes. The careful cutting up of the stump occupied several hours per day for over a week, but the varied forms of the inmates found, and afterwards bred, was ample reward for the time and pains spent in such interesting observations; and I only regret that more time could not be given to the solution of further points in the life-histories of certain species, of which I could find no reliable account in the literature I possess.

For the kind identification of doubtful species I am indebted to the following authorities, whose valued aid enabled me to draw up the appended list:—Mr. Edward Saunders kindly examined the Hymenoptera-Aculeata; Mr. T. R. Billups, the Parasitic Hymenoptera, &c.; Dr. Meade, the Diptera; Mr. H. C. A. Vine, the Aphididæ.

The list is not exhaustive, and several additions to the fauna of our stump could have been made had time permitted the examination of observed examples of Crustaceans, Myriapods, and Arachnoidea.

List of Insects found in an old Cherry-stump during April, May, and June, 1893.

COLEOPTERA.

CARABIDÆ.—*Calathus cisteloides*, Illiger. One specimen found dead in a burrow.

LUCANIDÆ.—*Sinodendron cylindricum*, Linné. One specimen found dead in a burrow.

CISSIDÆ.—*Cis boleti*, Scopoli. Twelve specimens alive in the cherry-bark.—*C. hispidus*, Paykull. Two specimens alive in the cherry-bark.—*C. nitidus*, Herbst. One specimen alive in the cherry-bark.

MELANDRYIDÆ.—*Melandrya caraboides*, Linné. Thirty-three bred from larvæ, April and May.

MORDELLIDÆ.—*Anaspis frontalis*, Linné; *A. fasciata*, Forster. One of each alive in cherry-bark.

ORTHOPTERA.

FORFICULIDÆ.—*Forficula auricularia*, Linné. One dead in a fossorial burrow and in a cell, in which it just fitted, and remains of others in other burrows.

HYMENOPTERA.

TENTHREDINIDÆ.—*Emphytus perla*, Klug. One female, April 26th, from borings.

CYNIPIDÆ. — *Synergus facialis*, Dalman. One female, May 15th, from borings.

CHRYSIDIDÆ. — *Omalus auratus*, Dahlbom. Nine, May and June, bred from burrows of *Pemphredon*.

ICHNEUMONIDÆ.—*Phygadeuon gravipes*, Gravenhorst. Two females, June, from burrows of *Crabro leucostomus*. — *Perithous varius*, Gravenhorst. One male and two females, May, from burrows of *Pemphredon*.

CHALCIDIDÆ.—*Pteromalus apum*, Westwood. Fifty specimens, May and June, from burrows of *Crabro*.

FOSSORES-POMPILIDÆ. — *Pompilus spissus*, Schiodte. One female, May 31st, found near burrows of *M. caraboides*.

FOSSORES-PEMPHREDONIDÆ.—*Pemphredon lugubris*, Latreille. Eighty, both sexes, April and May.—*P. shuckardi*, Moraw. Four, in April and May.

Fossores-Crabronidæ.—*Crabro leucostomus*, Linné. Seven males only from forty pupæ in May.—*C. cephalotes*, Panzer. Ten males and four females, May and June.—*C. chrysostomus*, Lep. Sixty-four males and twelve females, May and June. — *C. vagus*, Linné. Thirteen, chiefly males, June.

Anthophila-Apidæ.—*Anthophora furcata*, Panzer. One female out in May from burrows of *Crabro vagus*.

Lepidoptera.

Tineæ.—A Micro moth emerged end of May from pupa found on the cherry-bark, and not yet identified.

Hemiptera.

Homoptera-Aphididæ.—*Siphonophora* (*rosæ?*), *S.* (*pisi?*). Numerous in "larders" of *Pemphredon*.

Diptera.

Mycetophilidæ. — *Sciara nitidicollis*, Meigen; *S. nervosa*, Meigen; *S.* (*pulicaria*, Meigen?): *S.* (*præcox*, Meigen?). Imagines began to appear on April 27th, and continued coming out of the burrows up to June, when about forty had emerged. Two larvæ of *S. præcox* I found, on April 15th, in an untouched "larder" of *Crabro*, feeding on a mouldy *Rhingia rostrata*; these turned to curious horned pupæ end of April, and one imago emerged end of May. Probably all these *Sciara* feed in the larval state on the Diptera in the "larders" of *Crabro*.—*Exechia* (sp. ?). One specimen in June from borings.

Chironomidæ. — *Ceratopogon* (sp. ?). Several, both sexes; pupæ seen April 2nd, imagines June 9th, &c.

Psychodidæ.—*Trichomyia* (*urbica*, Haliday ?). Two specimens end of May.

Tachinidæ.—*Brachycoma erratica*, Meigen. New British species; bred male and female in May from borings of *Pemphredon*. Described by Dr. Meade in Ent. Mo. Mag., May, 1894, p. 110.

Anthomyidæ. — *Hyetodesia errans*, Fallen. One female, May 13th, from fossorial borings. — *Hylemyia festiva*, Zetterstedt. Rare; bred both sexes. Sixteen from borings of *Pemphredon*; out from April 26th to May 18th. Described by Dr. Meade in Ent. Mo. Mag., October, 1893, p. 285. The above specimens are recorded in same Mag. of December, 1893.

Sapromyzidæ.—*Lonchæa vaginalis*, Fallen. Three females, April and May, from borings of *Pemphredon*.

The following Diptera I identified among the stored prey in partially consumed and in untouched "larders" of the four species of *Crabro*. Numerous stores still remain to be examined.

Stratiomyidæ.—*Microchrysa polita*, Linné. Both sexes in nidus of *Crabro leucostomus*.

Syrphidæ.—*Melanostoma* (*mellinum?*). In nidus of *Crabro leucostomus*. — *Pyrophæna ocymi*, F. Females in nidus of *Crabro* (sp. ?).—*Platychirus albimanus*, F. In nidus of *Crabro* (sp. ?). — *P. fulviventris*, Mcq. Eight in one "larder" of *Crabro chrysostomus*. — *P. clypeatus*, Mg. Several in nidus of *Crabro* (sp. ?). — *Syrphus balteatus*, Deg. (one female); *S. ribesii*, Linné (two females). In one "larder" of *Crabro* *cephalotes*.—*Rhingia rostrata*, Linné. Three specimens in one "larder" of *Crabro cephalotes*.

Muscidæ.—*Pollenia* (sp. ?). In nidus of a *Crabro*.—*Musca corvina*, F. (two females); *Stomoxys calcitrans*, Linné (one female). In one "larder" (*C. vagus ?*).

Summary of Insects found in the Cherry-stump.

Order.	Families.	Genera.	Species.	No. of Specimens.
Coleoptera	5	5	8	52
Orthoptera	1	1	1	1
Hymenoptera	9	10	14	258
Lepidoptera	1	1	1	1
Hemiptera	1	1	2	12
Diptera	9	17	23	90
Total	26	35	49	414

King's Mill House, Painswick, Gloucestershire.

LIFE-HISTORY OF *VANESSA C-ALBUM*.

By F. W. Frohawk, F.E.S.

(Concluded from p. 262.)

The pupa:—Average length, $\frac{5}{8}$ in. Dorsal view: the head is square; the palpi-cases are widely separated, sharply pointed, curving inwards, and are very jaw-like in form; the thorax is biangular at the base of the wing, much nipped-in round the middle, giving a deep concavity to the wing, which is acutely angulated on the hind margin; the abdomen is attenuated, and the anal point elongated. Lateral view: the head is beaked in front; the thorax much swollen, with a central deep rounded keel, and is deeply sunken at the juncture of the abdomen; the dorsal line of the abdomen is curved, the posterior segment is truncated, and the anal point flattened and elongated, measuring $\frac{1}{12}$ in.; the outline of the lateral surface from near the apex of the antenna to the head is almost straight, the antenna incurving at the apex; the abdomen has a medio-dorsal series of very small ochreous yellow points, one on each segment, and smaller black points forming super- and sub-spiracular rows; the sub-dorsal series consists of larger points, especially on the 4th segment, which are large, conical, and sharply pointed; those on the 1st, 2nd and 3rd segments are of brilliant metallic appearance, resembling highly burnished silver, with opaline irradiance; the first pair are the largest and most compressed; a streak of brilliant coppery gold ornaments the anterior portion of the 3rd and 4th segments, running from the edge of the segment to the silver point; the ground colour of normal specimens is a pinkish buff, very delicately reticulated with black, two broad oblique dark olive-green bands cross the wing, one at the apex and the other across the middle; three bands of similar colour extend down the abdomen, one on each side, enclosing the black spiracles, the other is central along the under surface; the dorsal area of the abdomen is blotched with olive, and has a medio-dorsal line of pale pink; the thorax is streaked with deep pink; the palpi are black; on the hind legs is an olive streak shading into black, and terminating in a black point at the end of the tibia; there is also a smaller black point on the fore leg; the anal point is buff, streaked longitudinally with black, and is amply provided with shining brown hooks at the extremity. The outline of the hind margin of the wing-case is most dissimilar and disconnected to that of the true wing, which has the deep angular margin clearly defined in the pupa, which in the former is a simple curve. Some specimens are more uniform in colour, having the markings much less defined, especially on the wing, and are generally somewhat metallic, as if lightly washed over with gold-bronze, and in some the ground colour is a deep pink. The pupa is suspended by the anal hooks to a small dense silken pad spun by the larva, generally upon the under side of the stalk or midrib of the leaf, and also upon the stems of the plant. It remains in the pupal state from ten to fifteen days, but the time is entirely regulated by temperature.

The imago emerged (from the pupa described) on July 2nd, remaining eleven days in the pupa.

The descriptions are all taken from the same individual, from directly after the hatching of the egg to the emergence of the imago.

The entire brood were kept under similar conditions, corresponding as closely as possible to the outdoor temperature, purposely to avoid as much as possible any artificial rearing.

Cold, dull weather principally prevailed during all their stages. The ova and young larvæ were subjected to a temperature which fell as low as 41° during the night of May 21st, when several ova were hatched, and I found others hatching the next morning, the temperature then being only 50°; therefore the ova will hatch in a temperature between 40° and 50°, or rather a little above 40°, as apparently some had hatched during the early hours of the morning.

Immediately after the hatching of several ova, I placed the larvæ on different plants, and kept each plant isolated from the rest, so that the larvæ fed solely upon the same food through all the stages; the plants selected were red-currant, black-currant, gooseberry, elm, hop, and nettle; I found all six plants to be equally suitable as food for the larvæ. The majority were fed exclusively upon stinging-nettle. From this one brood I have a long series, numbering 200 fine specimens, consisting of 105 males and 95 females, making a fairly equal proportion of sexes;

41 are of the light fulvous form (27 males and 14 females), and 159 of the dark form (78 males and 81 females). The first imago emerged on June 30th, a male of the light form; the last emerged August 2nd, a male of the dark form.

As regards the two forms of this butterfly, I am able to confirm Mr. Harcourt Bath's remarks (Entom. 242), "that the dark form is the type of the first brood." Such is undoubtedly the case, as will be seen from the above, that out of the 200 specimens 159 are of the dark form, the remaining 41 being of the pale fulvous form, the proportion being about one to five. With few exceptions, the light forms were the first to emerge, the majority of them emerging during the first few days of July, and before any of the dark forms made their appearance.

It seems remarkable that two such very different forms occurring in both sexes should be the offspring of the same parent, and the light form to be the first to emerge. The pale or fulvous form is generally larger (my largest female measuring 2½ in. in expanse, and is palest in colour), and always very much less angulated in outline.

Balham, S.W., August, 1894.

THE COPROPHAGOUS LAMELLICORNS; A REVISED LIST OF SPECIES BELONGING TO THE GENERA *PACHYLOMERUS*, KIRBY, AND *ATEUCHUS*, WEBER.

By John W. Shipp.

Assistant in the Hope Dept., Oxford University Museum.

(Continued from p. 257.)

The following is a list of the species belonging to the genus appearing in the Ethiopian Region. Gemminger and Harold, Cat. Col. iv. 1869, catalogues 43 species. This has been further augmented to 72.

Ethiopian Region.

1. *ægyptiorum*, Latr., Voy. Cailliaud, iv. p. 279, t. 58, f. 10 (1827); Guerin, Icon. Regne Anim. Ins. t. 21, f. i.
    var. *purpurascens*, Gerstacker, Arch. f. Nat. xxxvii. p. 48.
    1.—Sennaar; Zanzibar. In Mus. Oxon.

2. *æruginosus*, Klug, Monatsber. Berl. Acad. p. 650 (1855); Peters. Reis. p. 212 (1862).
    metallicus, Boheman, Ins. Caffr. ii. p. 161 (1857).
    cupreus, Casteln., Hist. Nat. ii. p. 65 (1840).
    rutilans, Klug MS.
    1, 3.—Caffraria; Cape Town; Natal; Mozambique; Limpopo; Tette. In Mus. Oxon.

3. *ambiguus*, Boheman, Ins. Caffr. ii. p. 173 (1857).
sparsus, Germar MS.
3.—Caffraria; Natal; Cape Colony.

4. *bohemanni*, Harold, Col. Hefte iv. p. 104 (1868).
cicatricosus, Boheman, Ins. Caffr. ii. p. 177.
1.—Caffraria.

5. *bonelli*, McLeay, Horæ Ent. i. 2, p. 498.
hottentotus, Dej., Cat. 3rd ed. p. 150.
3.—Cape Colony.

6. *caffer*, Boheman, Ins. Caffr. ii. p. 169 (1857).
3.—Caffraria.

7. *clericus*, Boheman, Ins. Caffr. ii. p. 167 (1857).
3.—Caffraria.

8. *convexus*, Hausm., Illiger's Mag. vi. p. 249 (1807); ("Wiedeman" in Coll. Hope).
lævis, Thunb., Mem. Ac. Petr. vi. p. 408 (1818).
3.—Cape Town. In Mus. Oxon.

9. *cornifrons*, Casteln., Hist. Nat. ii. p. 64 (1840).
compressicornis, Klug, Symbolæ. Phys. v. t. 41, f. 1.
impressicornis, Reiche, Dej. Cat. 3rd ed. p. 150.
1.—Arabia; Nubia; Lower Egypt; Senegal R. In Mus. Oxon.

10. *costatus*, Wiedeman, Zool. Mag. ii. i. p. 21.
3.—Cape of Good Hope.

11. *cupreus*, Boheman, Ins. Caffr. ii. p. 163 (1857).
3.—Limpopo R.

12. *cuvieri*, McLeay, Horæ Ent. i. 2, p. 499; Casteln. Hist. Nat. ii. p. 65 (1840).
senegalensis, Dej., Cat. 3rd ed. p. 150.
lamarki, Klug MS.
1.—Senegal R. In Mus. Oxon.

13. *ebenus*, Klug, Monatsber Berl. Acad. p. 650 (1855); Peters, Reis. p. 214 (1862).
1.—Mozambique.

14. *festivus*, Harold, Col. Hefte iv. p. 79 (1868).
2.—R. Niger.

15. *flavicornis*, Boheman, Ofvers. Vet. Ac. Förh. p. 107 (1860).
1.—Svacop.

16. *fritschi*, Harold, Col. Hefte iii. p. 86 (1868).
1.—Orange Free State; S. Africa.

17. *funebris*, Boheman, Ins. Caffr. ii. p. 176.
3.—Caffraria.

18. *furcatus*, Casteln., Hist. Nat. ii. p. 66 (1840).
morio, Dej., Cat. 3rd ed. p. 150.
—Senegal R.

19. *galenus*, Westwood, Trans. Ent. Soc. iv. (1847), p. 226, pl. 17, f. 1; Lacordaire, Gen. des Coleop. Atlas, pl. 25, f. 5.
cephalotes, Dej., Cat. 3rd ed. p. 150.
paradoxus, Boheman, Ins. Caffr. ii. p. 170 (1857).
3.—Cape of Good Hope; Cape Colony; Limpopo R. In Mus. Oxon.

20. *goryi*, Casteln., Hist. Nat. ii. p. 64 (1840).
indicus, Dej., Cat. 3rd ed. p. 150.
1.—Senegal R. In Mus. Oxon.

21. *jalofi*, Casteln., Hist. Nat. ii. p. 64.
galamensis, Reiche MS. (in Hope Coll.).
1.—Senegal R. In Mus. Oxon.

22. *interstitialis*, Boheman, Ins. Caffr. ii. p. 171 (1857).
3.—Caffraria.

23. *intricatus*, Fabr., Syst. El. i. p. 56; McLeay, Horæ Ent. i. 2, p. 499; Casteln. Hist. Nat. ii. p. 66 (1840).
palemo, Oliv., Ent. i. 3, p. 187, t. 27, f. 234; McLeay, Horæ Ent. i. 2, p. 56.
3.—Cape Town; Cape Colony; Caffraria. In Mus. Oxon.

24. *isidis*, Casteln., Hist. Nat. ii. p. 64 (1840).
religiosus, Dej., Cat. 3rd ed. p. 150.
lophocnemus, Kollar MS.
1.—Palæarctic subregion. 2.—Nubia; Upper Egypt; Sennaar; Persia. In Mus. Oxon.

25. *lamarki*, McLeay, Horæ Ent. i. 2, p. 499.
guineensis, Dej., Cat. 3rd ed. p. 150.
var. *infernalis*, Klug, Monatsber. Berl. Acad. p. 650 (1855); Peters, Reis. p. 213 (1862); Boh. Ins. Caffr. ii. p. 168 (1857).
1, 2.—Senegal R.; Nubia; Guinea; Mozambique. In Mus. Oxon.

26. *lucidulus*, Boh., Ofvers. Vet. Ac. Förh. 1860, p. 107.
1.—N'Gami.

27. *morbillosus*, Fabr., Ent. Syst. i. p. 63; Syst. El. i. p. 56.
2.—Guinea; Gambia. In Mus. Oxon.

28. *modestus*, Boh., Ins. Caffr. ii. p. 165 (1857).
3.—Caffraria. Matabili-land.

29. *nigroæneus*, Boh., Ins. Caffr. ii. p. 165 (1857).
1.—N'Gami.

30. *parvulus*, Boh., Ofvers. Vet. Ac. Förh. 1860, p. 108.
3.—Svacop.

31. *proboscideus*, Guerin, Icon. Regne Anim. Ins. p. 73; Reiche, Dej. Cat. 3rd ed. p. 150.
1.—Senegal R. In Mus. Oxon.

32. *prodigiosus*, Erichs., Wiegm. Archiv. i. p. 231 (1843).
1 ?.—Trop. Africa.

33. *profanus*, Boh., Ins. Caffr. ii. p. 162 (1857).
1.—Caffraria.

34. *rubripennis*, Boh., Ofvers. Vet. Ac. Förh. 1860, p. 107.
1.—N'Gami.

35. *rugosus*, Hausm., Ill. Mag. vi. 1807, p. 270.
convalescens, Wiedm., Zool. Mag. ii. p. 21 (1823).
3.—Cape of Good Hope. In Mus. Oxon.

36. *rusticus*, Boh., Ins. Caffr. ii. p. 175 (1857).
3.—Caffraria.

37. *satyrus*, Boh., Ofvers. Vet. Ac. Förh. 1860, p. 107.
3 ?—Svacop.

38. *savignyi*, McLeay, Horæ Ent. i. 2, p. 503 (1821).
operosus, Dej., Cat. 3rd ed. p. 150.
transversus, Casteln., Hist. Nat. ii. p. 65 (1840).
3.—Cape of Good Hope; Cape Colony. Matabili-land. In Mus. Oxon.

39. *sennaariensis*, Casteln., Hist. Nat. ii. p. 66 (1840).
dongolensis, Reiche, Dej. Cat. 3rd ed. (1850).
sacer var., Latr., Voy. Cailliaud. iv. 1827, p. 280.
1.—Sennaar; Dongola; Nubia. In Mus. Oxon.

40. *paganus*, Harold, M. T. Munch. Ent. Ver. ii. p. 101 (1878); Col. Hefte xvi. p. 34 (1879).
1.—W. Centr. Africa. Matabili-land.

41. *plausibilis*, Peringuey, Trans. S. Afr. Phil. Soc. vi. 2, p. 25 (1892).
3.—South Africa.

42. *nitidicollis*, Lansb., C. R. Ent. Belg. xxvi. p. xxi.; Revoils, Faun. et Flor. Comal. Col. p. 12, pl. 1, f. 3.
1.—Somali Land.

43. *cribricollis*, Waterhouse, Proc. Zool. Soc. 1885, p. 231, pl. xv. f. 1.
1.—Kilima-njaro.

44. *thomsoni*, Waterhouse, Ann. Mag. Nat. Hist. (5), xv. p. 377.
1.—Masai Land.

45. *lævifrons*, Fairmaire, C. R. Ent. Belg. xxviii. p. cxxi.; Ann. Soc. Ent. Fr. 1887 (6), vii. p. 103.
1.—East Africa.

46. *planifrons*, Fairmaire, C. R. Ent. Belg. xxviii. p. cxxi.; Ann. Soc. Ent. Fr. 1887 (6), vii. p. 103.
1.—East Africa.

47. *opacipennis*, Fairmaire, C. R. Ent. Belg. xxviii. p. cxlii.; Ann. Soc. Ent. Fr. 1887 (6), viii. p. 103.
1.—East Africa.

48. *spencii*, McLeay, Horæ Ent. i. 2, p. 502.
?. Africa ?. Probably Senegal River.

49. *suri*, Hausm., Illiger Mag. vi. 1807, p. 244.
caffer, Serv., Encycl. Meth. x. 1825, p. 351.
capensis, Dej., Cat. 3rd ed. p. 150.
hottentotus, McLeay, Horæ Ent. i. 2, p. 498.
laicus, Illiger MS.
3.—Cape Colony; Cape of Good Hope; Port Elizabeth; Natal.
In Mus. Hope.

(To be continued.)

NOTES AND OBSERVATIONS.

THE VERTICAL DISTRIBUTION OF PIERIS RAPÆ.—I was always under the impression until recently that this butterfly was a lowland species, only being found in cultivated parts. I have, however, met with it this summer in the Grindelwald, at an elevation of nearly 7000 feet above the sea-level, which is well within the upper alpine zone of Speyer; while in the pine or lower alpine belt, some 1000 or 1500 feet lower, it was exceedingly plentiful. As I could find no trace of any cruciferous plant which could constitute the pabulum of its larva in either zone, I conclude that the insect does not permanently reside at such an elevation, but only occurs there in the winged state. Will any readers kindly inform me what is the greatest elevation at which they have observed this butterfly in the British Isles? My experience is that it is an exclusively lowland species, not occurring above the altitude of 1000 feet further north than latitude 52°.—W. HARCOURT BATH; Ladywood, Birmingham, Sept. 14th, 1894.

ZYGÆNA TRIFOLII AB.—In Mr. South's short notice (*ante*, p. 253) of the capture of a curious aberration of *Zygæna trifolii* by Mr. W. M. Christy, no mention is made of the condition of the legs. As there are two cases on record ('Materials for Study of Variation,' by W. Bateson, p. 148), one, of the replacement of a leg by a wing, and the other of the reverse phenomenon (although apparently neither seems fully substantiated), some further description relative to such points would, I feel sure, be welcomed by all students of variation. From the figure of the specimen I judge that the last pair of legs (at least) is normal; if so, it would seem that, for some reason, the development of the dorsal pair of metathoracic imaginal discs was arrested, and that an attempt had been made to supply their place by division of the dorsal mesothoracic disc *of one side*. Of course this is pure surmise, and some people may argue that it merely shifts the responsibility of an explanation farther back in the life-history, and that the changes suggested are as difficult to understand the reason of as the phenomenon itself; if so, the question must be an individual one; but it *does* seem to me to account, in however imperfect a manner, for that correlation of variations, the occurrence of which, considering the extreme rarity of all variations involving absence or reduplication of appendages, can hardly be attributed to chance. For, suppose, in the absence of statistics, that the probability of one such variation is 1 in 1000, and of another 1 in 1500 (which are, I think it must be admitted, high estimates, considering the number of insects annually examined), then the probability of the simultaneous occurrence of two such variations would be 1 in 1,500,000, or, to put it in another way, out of every 2499 individuals which exhibit variation there should be only one in which the two variations are correlated. If data of this sort were obtainable in any cases of variation, the extent to which the one variation depended on the other would be proportional to the amount of deviation from the result obtained by supposing complete absence of any such dependence. I should be glad to hear if any of your readers have tried this plan, or if they consider it a practicable means of settling such interesting points as correlation of variation, supposing it is possible to examine a sufficient number of specimens.—F. P. Bedford; Sept. 13th, 1894.

[I am obliged to Mr. Bedford for reminding me of an important omission in my short description of this remarkable insect. I should have mentioned that it had only four legs, as shown in the figure, and these, Mr. Frohawk informs me, are accurately drawn as regards size, shape, and position.—R. S.]

Note on Smerinthus populi.—I have set thirty-six specimens of *S. populi* bred from larvæ found here last summer; a few others came out, but were damaged or dwarfed, and I took no note of sex or colour, but they were not remarkable in any way. Of the thirty-six I now have thirteen are males and twenty-three females; none of the males are of the red form, and only one tending to a reddish purple; of the females, five are of the very light red form, seven of the ordinary red form, and the balance (eleven) same colour as males.—W. B. Thornhill; Castle Cosey, Castle Bellingham, August 19th, 1894.

Larvæ on Monkshood.—With reference to Dr. Knaggs' remarks (*ante*, p. 268) on larvæ feeding on *Aconitum*, I may mention that four years ago I examined this plant for larvæ of *Plusia moneta*, which, however, I did not obtain; but I found larvæ of *Phlogophora meticulosa*, and other common species, the names of which I cannot at this moment recollect.—W. M. Christy; Watergate, Emsworth, Hants.

Note on Naphthaline.—I should like to draw attention to the fact that naphthaline apparently will keep Lepidoptera relaxed for some days. Two of us on board this ship had been out insect-hunting at Mombasa (close to the equator), and had brought back a considerable number of specimens, which, owing to the ship being infested with small red ants, we could only set in detachments, as neither of us had a proper box for stowing setting-boards. On removing some of the insects from the collecting-box (which was *quite dry*), four days after capture, we found them perfectly relaxed, and fit for setting with the greatest ease. This condition of the insects would appear to be only due to naphthaline, as the atmosphere during the four days had not been at all damp. Previous to this occasion I had not found it necessary to put any of the preservative in my collecting-box, as I generally set insects within three hours of capture, but the enormous number of red ants now on board the ship compelled me to do so for safety's sake. [illegible] ll be very glad to know whether this property of naphthaline is a recognised fact.—PHILIP DE LA GARDE; H.M.S. 'Raleigh,' Cape of Good Hope, Aug. 28th, 1894.

A CORRECTION.—I beg leave to point out an error in respect to a locality mentioned in the 'Entomologist' for July (*ante*, p. 223). Bagley Wood is not in Oxfordshire, but in Berkshire, though only distant a few hundred yards from the river boundary, and within three miles direct south of the city of Oxford. This mistake occurs frequently in Newman's 'Butterflies and Moths,' Canon Fowler's 'Coleoptera,' and in various other works, and doubtless arises through the locality being mentioned as "near Oxford," when it is naturally presumed that it lies within that shire.—F. W. LAMBERT; 70, St. Giles, Oxford.

CAPTURES AND FIELD REPORTS.

OPHIODES LUNARIS.—Will the writer of a note on this species, who signs himself "One of the Innocents at Home," be good enough to send us his name and address, as we regret that we cannot publish his communication in its present form.

VANESSA POLYCHLOROS NEAR REGENT'S PARK.—I took a worn specimen of *Vanessa polychloros* in the garden here on August 26th. — CLAUD E. L. ELLIS; 69, Mornington Road, Regent's Park, N.W., Aug. 30th, 1894.

DEILEPHILA LIVORNICA AND NOLA STRIGULA IN DEVONSHIRE.—A specimen of *Deilephila livornica* was brought me by my gardener's boy on June 7th. Its identity has been confirmed by several entomologists. I have taken *Nola strigula* here; it does not seem to be known so far west by my friends.—C. F. BENTHALL; Cofton Vicarage, Starcross, Sept. 14th, 1894.

ACHERONTIA ATROPOS IN DEVON. — On August 14th last a villager brought me a splendid specimen of *Acherontia atropos*, taken in a potato field here.—CHAS. N. BUNN; Fremington, North Devon.

TAPINOSTOLA ELYMI IN SCOTLAND.—I have taken *T. elymi* at Montrose this year, and I believe that this is the first record of the occurrence of the species on the east coast of Scotland. — MONTAGUE GUNNING; The Mall, Montrose, N.B., Sept. 13th, 1894.

EARLY OCCURRENCE OF HYBERNIA DEFOLIARIA.—On the 11th of this month I took a fine specimen of this moth at light near Dulwich Wood. Is not this unusual?—G. S. ROBERTSON; St. Anne's, Thurlow Park Road, West Dulwich, S.E., Sept. 14th.

QUERY RESPECTING PIERIS BRASSICÆ.—It is rather strange this season that I cannot say certainly that I have seen a *Pieris brassicæ*, and I have been looking out for them, as I wanted some. I wonder if others have experienced the same scarcity.—W. J. LUCAS; 2, Gordon Road, Kingston-on-Thames.

PERONEA VARIEGANA IN NORTH-EAST CHESHIRE.—This is one of the few species of Lepidoptera that have not been really scarce this year around Macclesfield. Three forms, *i. e.*, the type, var. *asperana*, and var. *cirrana*, occurred in about equal numbers, and although all three were obtained from some hawthorn hedges in the district, certain of the hedgerows yielded a large proportion of *asperana* and *cirrana*, others of the type and *cirrana*, and others again of the type and *asperana*. From two hedges, about two miles from each other, *cirrana* was most frequently obtained, and in another hedge *asperana* was predominant. An interesting form, somewhat resembling *P. comparana*, was occasionally met with, but the form least often observed was var. *borana*, which bears a superficial likeness to *P. permutana*. The pretty var. *albana* was not seen, but three specimens were obtained which exhibit variation in the direction of that form. Some of the specimens referred to as var. *cirrana* have the ground colour bluish grey, others brownish grey. I should be glad to have information as to the distribution of this form of *P. variegana*.—Richard South; Macclesfield, Sept. 15th, 1894.

Dragonflies at Wisley Pond, near Cobham, Surrey. — With a friend I visited the pond on August 28th last, in search of dragonflies, and no sooner had we reached the margin than *Æschna grandis* were seen hawking up and down, and evidently getting a good supply of insects. So wary, however, were they that with difficulty one was secured, and although several were seen during the day, no more were taken. A long time was given to trying to catch a female of *Æschna juncea*, which was continually dipping the tip of her abdomen in the water, evidently depositing eggs in the shallow water (about 1 ft. deep) in a corner of the pond containing a bed of dry *Equisetum*. On our approaching almost within striking distance she moved off a few yards, and recommenced ovipositing as before. At length, losing sight of her, we went to dinner. On returning she (or possibly another) was still there, but soon fell a prey as she was resting with her wings on the surface of the water and her body immersed in it. Plenty of *Libellula striolata* were to be seen flitting about, and intermixed with them were fair numbers of *L. scotica*. In one corner of the pond was a colony of the handsome little dragonfly, *Lestes sponsa*, the females being bronze-green, and their somewhat smaller mates of the same colour, but powdered with blue on the thorax and the end of the abdomen. On revisiting the pond, on Sept. 11th, we found the dragonflies much the same as regards species, but the larger ones were not so much in evidence; and as we did not catch one of the blue species of *Æschna*, we could not decide whether those we saw were *cyanea* or *juncea*. — J. S. Brocklesby; 17, Fairlawn Villas, Merton, Surrey.

Note on Dragonflies.—During a stay in the New Forest from August 11th to 25th, I saw very few of the large dragonflies, and those were *Æschna grandis*, and probably *cyanea*; but *Libellula striolata* [*Sympetrum vulgatum*] was in plenty, flitting about here and there in its usual lively manner, suddenly appearing, hovering for a time in the air, and disappearing again with lightning rapidity. With it, near Beaulieu, some specimens of *L. scotica* were seen, and there I took one female *Orthetrum cærulescens*, but did not see her more gorgeous mate. Over Lymington River a few individuals, both male and female, of *Calopteryx virgo* were still flying, but their season was evidently over. Near Oxford, during the few hot days at the end of August, *Æschna grandis* was very plentiful, but extremely difficult to catch—in fact, I find this the strongest flyer, and the most wily in disposition, of all the dragonflies, except perhaps *Anax formosus*, whose acquaintance I have made. However, if one remains perfectly quiet for twenty minutes or so, while it is hunting around, its suspicions begin to be allayed, and a chance is usually given for a stroke, but it must not be ungling one, or the insect will probably go straight away, and be seen again no more. It might be interesting to note that one still afternoon, while watching this insect at Wisley Pond, in Surrey, myself and companion were able to hear the stroke of its wings a dozen or more yards away, while it was hunting aloft far out of reach.—W. J. LUCAS.

NOTES FROM HOLSWORTHY, N. DEVON.—I have taken *L. sinapis* by the roadside from April to Aug. 11th, but find them very scarce. *A. galatea* is fairly plentiful, but difficult to get in good condition, owing, I suppose, to the very bad weather we have experienced this summer. *Vanessa cardui* is very common in the larval state; I have taken them from three distinct species of thistle, and one on the common nettle. — S. KIPPING; Holsworthy, N. Devon, Aug. 18th, 1894.

NEMOBIUS SYLVESTRIS.—On Aug. 15th last this little brown cricket was in plenty near the Lymington River, in the New Forest.—W. J. LUCAS.

CIRRHŒDIA XERAMPELINA IN SOUTH ARGYLLSHIRE.—Seeing that this species is reported from Ayr (*ante*, p. 273), and that it is considered to be rare in the West of Scotland, it may be well to mention that *C. xerampelina* occurs about the Kyles of Bute, South Argyllshire, some fifty miles further north. Mr. King, in his published list of the Lepidoptera of the Clyde and district, does not mention this species. — W. M. CHRISTY; Watergate, Emsworth, Hants.

CIRRHŒDIA XERAMPELINA IN AYRSHIRE. — After working the lamps constantly for a fortnight, I was fortunate enough to take *Cirrhœdia xerampelina* on Sept. 4th. — WILLIAM C. S. FERGUSSON; Glencoy, Ayr, Sept. 14th, 1894.

COLIAS EDUSA IN 1894.—*Bucks.*—I secured to-day four male specimens of *C. edusa* near Ivinghoe (Bucks). Two of the specimens are in good condition, while the other two are rather worn.—CHARLES ROTHSCHILD; Tring Park, Tring, Sept. 1st, 1894.

Dorsetshire.—From Aug. 14th to Sept. 11th *C. edusa* was decidedly scarce at Weymouth. I never saw more than six or took more than three on any one day, and it required hard work to get them, as they appeared unusually lively. Has anyone noticed that *edusa* flies nearly always from east to west, rarely harking back, or is this my fancy? Other butterflies, I take it, remain in the place they were born, but not so *edusa;* at least, so it seems to me.—(Rev.) W. CLAXTON; Hartley Wintney, Winchfield.

Hampshire. — On August 16th a male specimen on the coast near Christchurch, and another on the 24th, not far from the same spot. — W J. LUCAS.

Middlesex.—On the morning of Sept. 14th, while giving orders to my men at the Harrow Metropolitan Coal Wharf, I saw a specimen of *C. edusa* flying up and down the railway bank. To the surprise of the "coalies," I instantly gave chase, and captured the prize with my hat—a fine male. I returned in the afternoon with my net, but only caught a few "blues" and "coppers." — C. RHOADES SMITH; Greenhill, Harrow, Sept. 14th, 1894. I saw a fine specimen of the var. *helice* in Acton on August 26th last. Not having my net with me, I was unable to make a capture. — ST. W. BELL-MARLEY; Hammersmith.

Surrey. — On Sept. 10th a female example at Oxshott, and a male at Cobham on Sept. 11th.—W. J. LUCAS.

Sussex.—*C. edusa* appears to have been fairly common in the Eastbourne district this autumn. My attention was first called to it on the 2nd inst., when one was seen near Birling Gap, and one or two others (it may have been the same one seen at two different times) in the hollows to the east of Beachey Head. On the 5th one was flying on a sunny bank in front of the Convalescent Home, but as no net was at hand on either occasion none of these were taken; they were, however, to all appearance freshly emerged. On the 6th an hour's ramble through the hollows under Beachey Head procured three specimens, two of which were captured and found to be in fairly good condition; but the sky assuming its usual cloudy aspect, further search was useless. The morning of the 9th broke with brilliant sunshine, and appeared to offer a good opportunity for a further investigation of the likely spots for the species; the wind, too, was favourable, for although N.E. and chilly, it had, by reason of its direction, no effect upon the hollows under the downs, all of which were well sheltered from it by the higher ground. Accordingly, an early start was made, and having compassed the length of the "parade," one of the first insects seen was *edusa*, and it was promptly secured. Continuing on through Holywell, which, although at one time a particularly rich little bit of collecting ground, appears now to be almost bare of insect-life, we struck inland across a clover-field, but failed to discover any *edusa* upon it. I was not altogether surprised at this, for I have usually found that where the cultivated clover is surrounded by down-sides not under cultivation, the waste land has a greater attraction for this species than the clover-fields. But we soon reached the rough ground beyond, and there was *edusa* flitting about, first one, which was soon secured, then another at a little distance; but as at this moment the clouds came over the sun, and a sharp shower swept across the downs, soaking the herbage, and bidding one seek any scanty shelter that could be found, operations had to be suspended. Fortunately the rain did not last long, and, the sun shining forth again, the butterflies were soon on the wing, flitting over the wet herbage as merrily as if nothing had happened; but chasing *edusa* over soaking ground is not the most pleasant occupation one can imagine, and as the rain soon came down again with renewed energy, the chase had to be abandoned, but not until we had made up our total for the morning to half-a-dozen specimens. That evening I returned to town, but enough has been said to show that *edusa* has been by no means uncommon in the Eastbourne district.—ROBERT ADKIN; Lewisham, September, 1894.

CATOCALA FRAXINI NEAR NORWICH.—I have to record the capture this morning of a male specimen of the rare *Catocala fraxini*, L., which I found at rest on the trunk of a small alder-tree on the banks of the Wensum, some two miles above Norwich. The insect was unfortunately rubbed in the catching.—E. W. CARLIER; 60, Unthanks Road, Norwich, Sept. 18th.

PIERIS DAPLIDICE AT RAMSGATE.—During my holidays this year at Ramsgate I was fortunate enough to capture a *Pieris daplidice*. — H. VINCE, Jun.; 6, Paragon Row, New Kent Road, S.E., Sept. 17th.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*August* 23*rd*, 1894.—E. Step, Esq., President, in the chair. Mr. Hall exhibited two cabinet-drawers of Diurni, captured in Switzerland during a fortnight in July, comprising about 100 species, among which were noticed specimens of *Hesperia lineola*, O. Mr. Filer, a very dark *Stauropus fagi*, L., from Ashdown Forest. Rev. J. E. Tarbat, a remarkable aberration of *Vanessa cardui*, L., from N. Wales [figured, *ante*, p. 277]. Mr. Mera, *Agrotis tritici*, L., and *A. aquilina*, Hb., stating that it was considered by some persons that these were forms of one species. A discussion ensued, Messrs. Barrett, Fenn, and others taking part. Mr. Frohawk, pupæ of *Vanessa urticæ*, L., showing beautiful variation in colour induced by artificial surroundings. Mr. Sauzé, various forms of *Formica nigra*, and contributed notes thereon.—H. Williams (*pro Report. Sec.*).

September 13*th*.—The President in the chair. Mr. R. Adkin exhibited short series of *Arctia caia*, L., bred this year, with notes on the variation shown by them; on behalf of Mr. South, a series of *Peronea variegana*, Schiff., from N.E. Cheshire, comprising all the named forms, except var. *albana;* on behalf of Mr. Murray, of Carnforth, a beautifully bleached var. of *Erebia æthiops*, Esp., from his neighbourhood; and, on behalf of Mr. W. F. de Kane, a pale grey var. of *Agrotis segetum*, from N. Ireland. Mr. C. G. Barrett, a specimen of *Plusia moneta*, Fb., taken at Norwich by Mr. Tillett; and a beautiful red var. of *Oncocera ahenella*, Zinc., taken at Folkestone by Mr. Purdey. Mr. Filer, series of *Epinephele hyperanthes*, L., from Brockenhurst and Halstead, showing local variation. Mr. H. Moore, male and female living specimens of the Orthopteron *Ephippigera vitium*, from Poictiers, and read notes as to their habits; he also contributed his observations upon Lepidoptera in France during August. Mr. A. Hall, a splendid var. of *Pyrameis myrinna*, from Bogota, S. America, with the type form for comparison. Mr. Dennis, a specimen of the "silver-fish," *Lepisma saccharina*. Mr. C. G. Barrett, photographs of the entomologists who recently met at Mr. Capper's house in Liverpool. Mr. Tutt gave a lengthy and interesting account of what Dr. Chapman and himself had observed during a tour through France, Switzerland, and N. Italy, especially referring to those species of Rhopalocera which occur in Great Britain. A discussion ensued, and Mr. Mansbridge gave a few remarks upon Lepidoptera in the Indian Territory, U.S.A. Mr. West, of Greenwich, exhibited a specimen of the rare Coleopteron, *Lebia cyanocephala*, L., from Bookham, with specimens of the two races of *L. chlorocephala*, Hoff., for comparison.—Hy. J. Turner (*Hon. Report. Sec.*).

Birmingham Entomological Society.—*August* 20*th*, 1894.—Mr. G. T. Bethune-Baker, V.-P., in the chair. Mr. R. C. B. Chase, Southville, Priory Road, Edgbaston, was elected a member. Mr. C. J. Wainwright showed *Stratiomys potamida*, taken in Sutton Park, and said it was the first undoubted capture of a *Stratiomys* near Birmingham of which he knew. Mr. R. C. Bradley read some notes upon *Merodon equestris*. He had recently been breeding a number from some larvæ sent to him by Mr. McLachlan, and these he showed, and described their manner of emergence, &c. He said that they took a very long time to dry their wings; twenty-four hours after emergence some of them were still quite limp; this he attributed to want of sun. He said that it was becoming not at all uncommon round Birmingham, and he had taken quite a large number at Sutton, although a few years ago it probably did not occur here. Mr. A. H. Martineau described some experiments he had been making upon different killing substances in order to ascertain their effect upon the colours of insects; amongst other things he had tried the fumes of sulphur, which certainly seemed to preserve the reds and yellows of Diptera and Hymenoptera better than ammonia or cyanide of potassium; if anything the effect being that the colours were heightened, not turned to black. On the whole he recommended a trial of sulphur.—COLBRAN J. WAINWRIGHT.

CARLISLE ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—An ordinary meeting of this Society was held at Tullie House on August 2nd, and, in the absence of the President, Mr. R. Leighton took the chair. The report of the field-day, which took place on the second race-day, was read; after which Mr. E. H. Day gave his paper on "Natural-History Observations during a Trip to Loch Lomond." It consisted of a list of birds and insects observed, with notes on the circumstances under which they were seen. During the evening one of the members casually mentioned that he had seen a whitish cockroach, whereupon an animated discussion took place on these interesting but troublesome pests. Among the exhibits were *Saturnia carpini*, *Lasiocampa rubi* and *L. quercus*, also some varieties of *Melitæa aurinia*, by Messrs. J. and G. Wilkinson. Mr. G. Wilkinson had a box containing the life-history of *S. carpini*, from the egg to the perfect insect.

August 16*th*.—The Rev. H. A. Macpherson (President) in the chair. Mr. Wilkinson read an interesting paper on the entomological productions of the first four months of 1894. In the course of the evening the conversation turned on the sagacity of animals. The exhibits, as usual, were numerous, including many hawk-moth and two specimens of *Acherontia atropos*, one of which was caught last year at St. Ann's Hill near Carlisle. Mr. Wilkinson showed a large number of preserved larvæ.—JOHN BUCKLE, *Hon. Sec.*

OBITUARY.

WE learn with very great regret that Mr. WILLIAM MACHIN died of apoplexy on August 13th last, aged 72 years. He was an expert field-entomologist, and a most successful rearer of Micro-lepidoptera. It was on the occasion of one his excursions in quest of some of these in their earlier stages that he discovered the larvæ of *Phorodesma smaragdaria* on *Artemisia*. This fact was not made publicly known until 1886, when Mr. Elisha referred to it in a paper on the life-history of the species read before the Entomological Society of London. Mr. Machin was a frequent contributor to the early volumes of the 'Weekly Intelligencer,' which ceased its career in 1861; and he was an old and valued correspondent of the 'Entomologist.' He did not often write at any great length concerning the habits or life-histories of the rarer species of Tortrices or Tineæ, with which he was so well acquainted; but he was ever ready to share his knowledge with those who sought his assistance, provided he felt satisfied that his confidence would not be abused. Mr. Machin was held in high estimation by a large circle of entomologists, and his death will be widely and deeply deplored.

THE ENTOMOLOGIST

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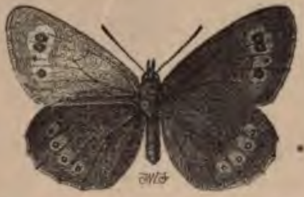
A CURIOUS ABERRATION OF *EREBIA ÆTHIOPS.*



THE above figure represents a "bleached" variety of *Erebia æthiops*, taken by Mr. H. Murray, of Carnforth, on August 10th, 1894, near that town. The specimen is somewhat below the normal size, being only 1 inch 8 lines in expanse; both right wings and the left hind wing are normal, but the whole area of the right fore wing is "bleached," the usually rich brown ground colour being reduced to a silvery brown-grey, and the colour of the patch enclosing the ocelli to a dirty yellow, on which the ocelli are conspicuous. The under side of this wing has the colour similarly reduced in tone, and when held to the light the wing is semitransparent.

The specimen is interesting, as exhibiting a phase of variation of somewhat frequent occurrence in *Epinephele ianira*, but which appears to have been seldom detected in the species under notice.

ROBERT ADKIN.

NOTES FROM NORTH LANCASHIRE.

BY J. ARKLE.

WHY the summer of 1894, with its cloudy skies, intermittent sunshine, thunderstorms and drenching showers, should be so opposite in character to that of 1893, is a matter which may be dismissed as beyond even the ken of scientists. Rather is it that the collector, before setting forth under such conditions, should examine his resources wherewith to withstand the warring elements. Should he send the scale down with a thump at twelve stone, he will probably find the mackintosh insupportable. The umbrella admits of more ventilation, but it has its disadvantages, and moreover is always a nuisance when not required. Lastly, there are spirits who, despising such contrivances, more than whisper the wisdom of neutralising the wet outside by an inward application. The various expedients will continue to meet at least sectional support, while all must agree that the chief desideratum is soundness in wind and limb.

With little more than a passing glance at such philosophy I took the way, once more (July 24th), to one of the finest hunting-grounds imaginable—North Lancashire. The raid on the insects began next day with a visit to Heysham Moss, near Morecambe, in company with a friend. Here we saw *Carsia paludata* var. *imbutata* still on the wing and in good condition, but *Cœnonympha typhon* (*davus*), *Hyria muricata* (*auroraria*), and *Acidalia fumata* were over. This is remarkable, as I have previously taken, at the date, all the species together, both at Heysham and Witherslack—*A. fumata* being near the vanishing point. *Bombyx quercus* and *Anarta myrtilli* were also observed on the Moss. We were getting on well, and the moths enjoying the hot sunshine, when a labouring man approached us—evidently with fell intent. He informed us his business was to order all persons of our persuasion off the Moss. This was most disappointing, but the thing was so nicely done, so sympathetically and yet so firmly, that we lingered little after realising the situation. The ruling passion, however, was strong, even in defeat, and we netted a few *C. paludata* as we trudged off. The very elements had suddenly become hostile, and a severe thunderstorm, with the usual accompaniments of sheet and forked lightning, with possible thunderbolts, made the place like a battlefield. We were soon wet to the skin, and had nothing to do but make the best of it until we reached Lancaster. Our repulse was a strange matter, and we did not improve it by afterwards asking permission of the landowner (who is a patron of the Lancaster Field and Entomological Club) to again visit the Moss. The request was declined, with regret. In bidding goodbye to the incident, and I suppose to Heysham Moss, it is needless reminding the reader that the owner is within his rights. The chief matter for regret is that the closing of this fine hunting-ground, where good insects are plentiful in the season and within narrow limits, should have been precipitated by the indiscretion of visitors.

But away we were next morning, to other fields and pastures new, like true nomads. Clougha Pike, one of the outlying Pennines, some 1500 feet above the sea and five miles east of

Lancaster, was the goal; for was not *Plusia interrogationis* taken there by the score last year, and would not *P. interrogationis* linger there still! What though our series were full of the moth—we do not see it fly every day, and we would go and see it! There were four of us—Messrs. Kershaw and Parker, of Lancaster, with our old friend, Mr. H. Murray, of Carnforth, as chief. For the double reason that we meant to *work* all the way and that the ground became more hilly as we walked along, our method of procedure was primitive, and dated before the invention of the wheel.

On either side of the road were occasional sallows, low birch and foxgloves. The two first did not give us a single caterpillar, but it was seldom we examined a foxglove without finding *Eupithecia pulchellata* inside the blossoms. At last the Pike was reached, and we found it a very different thing to the easy-looking height it appears when seen from Lancaster. The sides are clothed with heather, but seamed by deep ravines—each with its mountain torrent. Huge boulders are strewn about in eccentric positions, and the south-west slope of the mountain is a tumbled heap of rocks which ought to be interesting to the geologist. Although the sun was hot and the day favourable, *P. interrogationis* did not put in an appearance. From a youthful entomologist we learnt that a few individual specimens had been captured, but the insect had evidently determined to sustain the erratic character of the Plusiidæ as we saw none. *B. quercus* was an occasional visitor—our young friend having a fresh female in his possession. But the males were all more or less rubbed and chipped—experienced, in short, and shy; so the "assembling" was a poor exhibition. Butterflies were only represented by a few *C. pamphilus*, amongst which I netted two yellowish specimens and a black-bordered one. The other heath insects were *A. myrtilli*, *Agrotis porphyrea* and *Larentia cæsiata*. But one of the charms of entomology is that the unexpected so often happens, and on this occasion the charm was all on the side of unexpected interest. A commoner moth than *L. didymata* could not well be, but here it was in hundreds if not thousands. And a very different insect it was to the dusky representative of the lowlands. With the ground colour of the wings a pearly white, with its spots, bars and zigzag lines almost absent in frequent specimens, or gradually rising to the type in others, it formed an object over which the student in variation might well become enthusiastic. The difficulty would be to devise a name for each particular form. I only wish I had secured a drawerful, but, in our continued search for *P. interrogationis*, the chance slipped by.

In the ravines, wooded on each side with low growths of oak and other trees, we came across *Hypsipetes sordidata* (*elutata*), varied as usual, some being beautifully green (alas, the green fades !), others of the smoky form. Another moth in these glens worth a passing notice is *Cidaria populata*. The ground colour of the upper wings was not so yellow as in our Delamere Forest insect; it was more obscured by smoky shades and darker central bands; more approaching the blackish examples which are to be met with at Rannoch.

Tea was thoroughly enjoyed at a farmhouse near the foot of the Pike, and then we set off for home. About midway along, to the right of the road and over the high stone wall, is a deep little glen about thirty yards across, with, of course, the inevitable brook at the bottom. The sides were clothed with tall grasses in full flower, ferns, oak and bramble scrub, and a perfect illumination of blossoming foxgloves. This fairy spot we had reserved for our return, and it well repaid us for in a quarter of an hour we had as many larvæ of *E. pulchellata* as we cared to take. I took, in addition, a green Noctua caterpillar out of one of the foxglove flowers—probably a *Dianthœcia*. All have gone down, long ago, for their winter sleep.

Although a black, ominous cloud rose in the afternoon over Clougha Pike and followed hard upon us on our way home, the sea horizon was clear and sparkling in the sun away to windward (S.W.) next morning. By an early train we again joined Mr. Murray, at Carnforth Station, and made our way *viâ* Arnside and the Kent embankment to Witherslack Moss. At rest on the rocks where we left the embankment we took *Gnophos obscuraria* and a fine, but doubtful, *Scoparia*. Fringing the cornfields *Chrysanthemum segetum* (corn marigold) showed its wealth of yellow flowers just as it did two years ago, and an occasional *Argynnis aglaia* or *A. adippe* lent animation to the scene. On the Moss lots of fresh *B. quercus* let us a good deal into the secret of "assembling," about which I may have something to say in a future paper. Many *C. paludata* (*imbutata*) were netted, and in fine condition, one *H. muricata* (*auroraria*) and a couple of male *Nemeophila plantaginis*. *Crambus margaritellus* and *Mixodia schulziana* were nuisances, as we frequently mistook them, when on the wing, for *C. paludata*.

Our next ground was Meathop Moss, by the side of the wood. Here *Selidosema ericetaria* (*plumaria*) was a plentiful insect, although rubbed and chipped as a rule. Females were not so common as males. *N. plantaginis* was again met with.

Retracing our steps, and taking larvæ of *Eupithecia constrictata* by the way, off flowers of wild thyme, we made the best of a waning day in a hurried visit past the Derby Arms and through the village of Witherslack to the Pug Rocks. Our object was *Sciaphila penziana*, and, although late in the season as well as late in the day, we got a fine specimen at rest on a rock face.

Other captures were *Satyrus semele*, *Epinephele ianira* (both in faded condition), and two or three *Anaitis plagiata*.

On the 29th, amid splendid weather, we again joined Mr. Murray at Carnforth, and took tickets for Cark just by the north shore of Morecambe Bay. From Cark we walked the road (five miles) through the Holker Mosses to Haverthwaite, working the mosses on either side. To the left they extend almost to the estuary of the Leven—the short river which supplies an outlet to Lake Windermere. On the right the moss-land is abruptly terminated by rocky and densely wooded heights, the whole forming scenery of the loveliest description. Along the road—wooded on either side by sallows, mountain ash, birch and oak—we took *Acidalia incanaria*, pale *Melanippe fluctuata*, *Acronycta psi* and *Cosmia trapezina* at rest on walls or tree trunks, and Mr. Kershaw secured a fine specimen of *Venusia cambrica* (*cambricaria*). By beating mountain ash I netted a few Crambidæ which have been identified as the rare *C. fascelinellus* (*pedriolellus*). Larvæ of *Euchelia jacobææ* were abundant on the roadside ragwort, and *Gortyna ochracea* (*flavago*) in stems of thistle and burdock. On the moss to the left of the highway a few *Lycæna ægon* were captured, fresh from the chrysalis. It is worth remarking that this butterfly was well out last year at Abersoch in the first week of June. The North Lancashire form is of the usual size. The silvery spots are very pronounced in both sexes. The females (which were scarce) are bluer than usual, and show the red marginal spots on the wing surfaces indistinctly. I saw no specimens in which these spots were present on the upper wings, and in two examples they are entirely absent on the lower. Amongst the three *N. plantaginis* taken on the moss was a male, unfortunately rubbed, with the yellowish markings on the upper wings replaced by white. "Skippers" were represented, as at Witherslack, by *Nisioniades* (*Thanaos*) *sylvanus*, "Fritillaries" by a few late *A. adippe* and *A. aglaia*, "Geometers" by *G. papilionaria*, and "Micros" by *Pyrausta aurata* (*punicealis*), *P. purpuralis*, and *P. ostrinalis*. A fine caterpillar, probably a female from its size, of *Saturnia pavonia* (*carpini*) fell to my share feeding on heather. It was a matter of curiosity, as imagines were flying plentifully enough, to come across a large, full-fed caterpillar of *B. quercus* lying on the roadway, but cut almost in two by a passing vehicle. Haverthwaite, about four miles south-west of Lake Windermere, closed a most interesting day, and we trained back to Carnforth and Lancaster *viâ* Ulverston and Grange.

Here the weather fairly broke down. Intervals there were when something entomological could be done, and in one of these a sugaring party was organised. But the result was utter failure—we did not attract even an earwig. In spite of the rain it was getting time for *Erebia æthiops* (*blandina*) by the first of August.

A summons from our chief, on the 4th, set everything else aside, and early the following morning, although the slate roofs were wet, we saw the sea horizon clear and sunny again over Sunderland Point. But Flattery never smiled so fair. We soon found ourselves at Carnforth Station, and met Mr. Murray as if we had been dispensers of the weather. Away we went to Witherslack, and beyond, through hazel dingles gay with nuts, where holly, yew and juniper find a natural growth, where the hop-bine climbs, and primrose and scented violet speak the glories of departed spring. I had never seen *Blandina* on the wing, and it was a treat. For there we found it in scores, fresh from the chrysalis, flitting like *E. ianira* (against which it seems to have considerable animosity) over grassy hillocks or in open spots in woods. It looks almost black on the wing. We soon had as many as we could wish. The specimens captured showed considerable variation. The "chestnut antemarginal band of the forewings shaped like a human footprint" varies in shape and width and is sometimes prolonged to the inner margin. (My quotations are from Mr. Kane's apt description of the insect in his 'European Butterflies,' p. 105). The author goes on to mention "a double, bipupilled, apical eye, and a second (often a third) lower down" upon the chestnut band. These characters appear in the Witherslack specimens. Sometimes the additional eye is equal in size with the others, especially in females which, by the way, were scarce in comparison with males; sometimes it is small and without the white pupil; sometimes, when indistinct, it appears only upon one wing; and in other examples it is not repeated on the under side. The hind wings show little variation, but are sepia brown like the upper, and "with an antemarginal row of eyes upon chestnut patches not very conspicuous." As the "eyes" are jet black and the pupils a pure white, they give the butterfly a handsome appearance. The eye-patches are usually three, but females often possess four.

We next turned our attention to *Gonopteryx rhamni*, which was just appearing. Mr. Murray netted a fine specimen, the only one captured. Since that date, however, the butterfly has been on the wing in hundreds at the place. After noon the day entirely changed, and, finding nothing more was to be done, we made tracks for Arnside to catch the train home. Long before we reached the Kent viaduct we were wet through.

A word or two in conclusion about the dragonflies. On the mosses, excepting Heysham, *Libellula quadrimaculata*, *Sympetrum scoticum* and *Æschna juncea* were captured or identified. But these species do not appear in anything like the Delamere numbers. Another dragonfly, which has up to the present evaded capture, I believe will some day turn out to be the grand *Anax formosus*. On the limestone, whilst netting *Blandina*, I saw a second doubtful species, of the *Æschna* type, but altogether different to anything I have seen described. The wings were colourless, the body pale with just the faintest tint of lavender. I left the butterflies at once, but before I reached the coveted prize it was gone, and I saw it no more.

Chester, September 18th, 1894.

FURTHER OBSERVATIONS UPON *EMYDIA CRIBRUM.*

By J. H. Fowler.

In the 'Entomologist' for November, 1892 (xxv. 269), I gave a brief account of *Emydia cribrum*, describing the larva, &c., before hybernation; and although I failed in bringing the larvæ through the winter, I have, as will be seen by the following account, watched them through their metamorphoses. *Cribrum* is a slow feeder, therefore a troublesome species to rear.

Upon a certain heath near Bournemouth, during July and August of 1893, this species was taken abundantly; and about March the 10th of this year I went to the said heath with Mr. Taylor to obtain larvæ, and found them in fair numbers. A few visits secured me about 150; several collectors obtained greater numbers before my arrival. The locality is situated upon a level piece of ground bordering a pine wood, where *Aira cæspitosa* grows almost alone, with just here and there a clump of heath; it was upon the grass that we found the larva; none were to be seen upon anything else.

I always found the larva upon the sunny side of the *Aira*, stretched out and evidently enjoying the rays of the sun, in fact very similar to nearly all larva of the Arctiidæ upon coming out of winter quarters. Securing themselves to a blade of grass firmly, they were easily detected, being almost black upon the bright green grass; the least touch caused them to roll into a compact ring. I took many fresh from hybernation, the sand still sticking to their skins; they were then just ¼ in. in length.

March 20th. A few changed their skins. Dorsal stripe broadly grey, subdorsal lines a shade darker; laterals broad dirty red, under portions grey, just tinged with red; each segment with four tufts of radiating hairs or bristles situated upon very prominent polished black warts, the dorsal pair being semidouble; laterals less conspicuous and single.

April 5th. Many skins cast. Length now ⅝ inch; all markings very distinct, a few have the dorsal stripe tinged with green; three larvæ black upon dorsal portions, and in addition to the laterals being reddish the whole under portion is now of the same colour.

May 10th. Last skin changed. Length ¾ inch; stout, and slightly tapering at each extremity; markings have changed considerably; dorsal stripe almost white; laterals and intermediate spaces all grey; remaining dirty red. The whole skin appears greasy; the dorsal rows of hairs have become quite stiff, jet black, but each radiating clump is centred with four or five grey hairs; laterals in some cases have almost vanished; the warts are very prominent now, black and shining upon the pale ground. The head also jet black, highly polished, and deeply notched in the centre.

I fed the larvæ throughout upon common groundsel, as they did not seem to do well upon any other plant. In handling, the bristles enter the skin, causing a slight irritation.

June 12th. Two pupated; the larvæ settled in the corners of the box and spun an extremely light cocoon of white silk, not strong enough to support them, as both fell out and pupated upon the soil. When first formed the pupa is pale reddish, with the tubercles, &c., showing distinctly, but within twelve hours the whole becomes jet black and polished; anal angle smooth and rounded, immovable; it greatly resembles the pupæ of *E. jacobææ*. Other larvæ pupated up to July 25th, right in the centre of the *Aira* plants, forming small and very frail egg-shaped cocoons. Several died, but many were infested by a small *Microgaster*, which emerged from all portions of the host, and spun up small white cocoons; the flies from these were black, with red legs. They began emerging during April.

July 12th. The first imago of *E. cribrum* emerged, and from that date the dates of emergence were as follows:—

	♂	♀		♂	♀		♂	♀
July 12th ...	1	0	July 25th ...	2	2	Aug. 5th ...	2	0
,, 16th ...	0	1	,, 26th ...	0	1	,, 6th ...	1	0
,, 17th ...	1	0	,, 27th ...	1	0	,, 8th ...	0	1
,, 18th ...	0	1	,, 28th ...	1	4	,, 9th ...	0	2
,, 19th ...	1	1	,, 30th ...	0	2	,, 11th ...	3	0
,, 20th ...	0	2	Aug. 1st ...	1	0	,, 12th ...	1	0
,, 21st ...	1	2	,, 2nd ...	0	1	,, 16th ...	1	0
,, 22nd ...	0	3	,, 3rd ...	0	1	,, 20th ...	1	0
,, 23rd ...	1	3						

Several specimens bred were cripples, but these are not included in above.

It may be interesting to give the dates of capture of the imago in the Ringwood locality:—June 13th, a female; June 21st, thirteen; June 27th, fourteen; on July 3rd and subsequent dates I went for it, but did not see any. The Ringwood ground for this species is about fourteen miles from its Bournemouth haunts.

The series bred are more typical than I get here; one male has a beautiful black central band, a few are almost black, the grey nervules being conspicuous, but nothing very remarkable.

Poulner, Ringwood, Hants, Sept. 8th, 1894.

THE COPROPHAGOUS LAMELLICORNS; A REVISED LIST OF SPECIES BELONGING TO THE GENERA *PACHYLOMERUS*, KIRBY, AND *ATEUCHUS*, WEBER.

BY JOHN W. SHIPP.

Assistant in the Hope Dept., Oxford University Museum.

(Concluded from p. 293.)

ETHIOPIAN REGION.

50. *westwoodi*, Harold, Col. Hefte v. 1869, p. 95.
1.—S.W. Africa.

51. *venerabilis*, Harold, Col. Hefte viii. p. 2.
1.—North Abyssinia.

52. *æratus*, Harold, Col. Hefte viii. p. 2; Gerst. Van de Decken's Reisen, iii. pt. 2, pl. 7, fig. 5.
var. *minor*, Harold, Col. Hefte viii. p. 2.
1.—Zanzibar.

53. *pustulosus*, Harold, Col. Hefte viii. p. 2.
1.—Zanzibar.

54. *catenulatus*, Gerst., Harold's Col. Hefte viii. p. 2.
1.—Zanzibar.

55. *salebrosipennis*, Fairmaire, C. R. Ent. Belg. xxviii. p. cxlii.; Ann. Soc. Ent. Fr. 1887 (6), vii. p. 104.
1.—East Africa.

56. *nepos*, Fairmaire, C. R. Ent. Belg. xxviii. p. cxlii.; Ann. Soc. Ent. Fr. 1887 (6), vii. p. 104.
1.—Zanzibar.

57. *vethi*, Lansberge, Notes Leyd. Mus. 1886, p. 69.
1.—Benguela.

58. *vanderkelleni*, Lansberge, Notes Leyd. Mus. 1886, p. 70.
1.—Humpata.

59. *corinthius*, Fairmaire, Ann. Soc. Ent. Fr. 1887 (6), vii. p. 102.
1.—East Africa.

60. *stigmaticus*, Fairmaire, Ann. Soc. Ent. Fr. 1887 (6), vii. p. 102.
1.—East Africa.

61. *politifrons*, Fairmaire, Ann. Soc. Ent. Fr. 1887 (6), vii. p. 105.
1.—East Africa.

62. *sericeipennis*, Fairmaire, Ann. Soc. Ent. Fr. 1887 (6), vii. p. 107.
1.—East Africa.

63. *platynotus*, Bates, Ent. Mo. Mag. xxiv. p. 201.
1.—East Africa.

64. *porosus*, Bates, Ent. Mo. Mag. xxiv. p. 202.
1.—East Africa.

65. *canaliculatus*, Fairmaire, Ann. Soc. Ent. Fr. 1888 (6), viii. p. 177.
3.—South Africa.

66. *rostratus*, Peringuey, Trans. S. Afr. Phil. Soc. iv. p. 92.
3.—South Africa.

67. *sulcipennis*, Quedenfeldt, Berl. Ent. Zeit. xxxii. pl. 161.
1.—Central Africa.

68. *poggei*, Waterhouse, Ann. Mag. Nat. Hist. (6), v. p. 367 (1890).
1.—Congo.

69. *reichei*, Waterhouse, Ann. Mag. Nat. Hist. (6) v. p. 365 (1890).
3.—Cape of Good Hope.

70. *anderseni*, Waterh., Ann. Mag. Nat. Hist. (6), v. p. 366 (1890).
1.—Lake Nyassa.

71. *subæneus*, Harold, Col. Hefte. v. p. 57 (1869).
lamarki, Casteln. (non incert).
cuprifer, Sturm. Cat. 1826, p. 98.
1.—Senegal R.

72. *pubiventris*, Lansberge, Col. Hefte xii. p. 5 (1874).
1.—Mozambique.

Palæarctic Region.

73. *acuticollis*, Motsch., Bull. Mosc. 1849, iii. p. 104; Dohrn, S. E. Z. xliii. 1882, p. 372.
Kirgisia.

74. *carinatus*, Gebl., Bull. Ac. Petr. viii. p. 371 (1841); Motsch. Bull. Mosc. 1849, iii. p. 106.
Siberia; N.E. Russia; Ural Mts.

75. *cicatricosus*, Lucas, Expl. Alger. Ent. p. 249, t. 23, f. 5 (1849); Rosenh. Their. Andal. p. 127; Dej. Cat. 3rd ed. p. 150.
Andalusia; Gibraltar; Algeria.

76. *impius*, Herbst, Kafer. ii., p. 302, t. 20, f. 1; McLeay, Horæ Ent. i. 2, p. 499.
sacer var., Schonh. Syn. Ins. i. p. 58.
S. Europe (?).

77. *laticollis* (*Scar.*), Linn. Syst. Nat. 2, 549, 38; Fb. Syst. Ent. i. 28, 110; Spec. i. 31, 140; Mant. Ins. i. 16, 160; Ent. Syst. i. 62, 206; Herbst, Kafer. ii. p. 307, pl. 20, f. 6; Petagné, Spec. 2, 4; Oliv. Ent. i. n. 3, p. 152, 185, pl. 8, f. 68; Panz. Ent. G. p. 17, 68; Faun. Germ. 48, 8; Rossi, Faun. Etr. p. 14, 33; Sulz. Hist. pl. 1, f. 3.
(*Copris*), Oliv. Encycl. Meth. t. 5, p. 171, 119.
(*Ateuch.*), Fab., Syst. El. t. 1, p. 55; Walck. Faun. Par. i. p. 8; Sturm. Deutsch. Fn. i. p. 69; Latr. Hist. Nat. t. 10, p. 95, 4; Suckow, Naturg. p. 205; McLeay, Horæ Ent. p. 54; Boit. Man. t. i. p. 314; Casteln. Hist. Nat. ii. p. 65.

serratus, Fourc, Ent. Par. p. 13.
hottentota, Dumeril, Dict. des Sc. Nat. t. 5, p. 280; Geoff. Hist. Nat. i. p. 89.
var. *lævicollis*, Mulsant, Col. Fr. Lamell. p. 52.
Italy; France; Spain; Barbary; Tunis; Sardinia, &c.

78. *pius*, Illiger, Mag. ii. p. 202; Sturm, Ins. Deutsch. i. p. 66; McLeay, Horæ Ent. ii. p. 498; Erichs. Nat. Ins. iii. p. 752.
eremita, Stevens, Dej. Cat. 3rd ed. p. 150.
europæus, Motsch., Bull. Mosc. 1849, iii. p. 103.
sacer, Laicht. Ins. Tyrol. i. p. 15; Duft. Faun. Austr. i. p. 154; Sturm. Verz. Od. Ent. Handb. 76, 64.
var. *affinis*, Brulle, Exp. Sc. Morea, p. 165, t. 38, f. 3.
var. *digitatus*, Motsch., Bull. Mosc. iii. p. 105 (1849).
var. *infirmus*, Fisch., Ent. Ross. ii. p. 211, t. 27, f. 5.
var. *opacus*, Motsch., Bull. Mosc. iii. p. 107 (1849).
var. *punctulatus*, Muls., Col. Fr. Lamell. p. 46 (1842).
var. *retusus*, Brulle, Exp. Sc. Morea, p. 166, t. 38, f. 4.
var. *subsulcatus*, Muls., Col. Fr. Lamell. p. 46 (1842); var. β, McLeay, Horæ Ent. ii. p. 498.
Fr.?; Sicily; Crimea; Russ. Mer.; Armenia; Greece; Caucasus; Palestine.

79. *puncticollis*, Latr., Mem. Mus. Hist. Nat. v. p. 7, t. 18; Dej. Cat. 3rd ed. p. 150; Lucas, Exp. Alg. Col. pl. 23, f. 6.
armeniacus, Ménétr., Cat. Reis. p. 173.
hypocrita, Casteln., Hist. Nat. ii. p. 64.
parumpunctatus, Klug, Symb. Phys. v. t. 41, f. 2.
var. *nigrociliatus*, Motsch., Bull. Mosc. 1849, iii. p. 107.
var. {*nudifrons*, Fisch., Ent. Russ. ii. p. 211.
{*laticollis*, Fisch., *l. c.*, t. 27, f. 6.
var. *sericeus*, Motsch., Bull. Mosc. 1849, iii. p. 107.
Armenia; Caucasus; Persia; Egypt; Algeria; Palestine; Turkey; Volga; W. China.

80. *sacer* (*Scar.*), Linn., Syst. Nat. i. pt. 2, p. 545; Amœn. Acad. t. 5, pl. 3, f. 189; Fb. Syst. Ent. pp. 28, 109; Spec. Ins. i. p. 31; Mant. Ins. i. p. 16; Ent. Syst. i. 62, 205; Lepech. Tagebr. i. p. 249; Goeze. Ent. Beytr. i. p. 15; Fuess. Mag. i. pp. 144 et 166; Laicht. Verzeich. i. p. 15; Schæf. Icon. pl. 201, f. 3; Herbst, Kafer. t. 2, p. 304, 107, pl. 20, f. 2; Petagné, Spec. pp. 2, 3; Reamur, Gen. Ins. pl. 1, f. 3; Oliv. Ent. i. n. 3, pp. 150, 183, pl. 8, f. 59; Rossi, Faun. Etr. i. p. 14; ed. Helw. t. i. p. 15; Panz. Ent. Germ. p. 17; Faun. G. 48, 7; Blumenb. Handb. p. 326; Man. p. 397; Tigny, Hist. t. 5, p. 251, f. 1; McLeay, Horæ Ent. 49, i. var. *a*; Muls. Col. Fr. Lamell. p. 46 (1842).

(*Copris*), Oliv. Encycl. Meth. t. 5, 170, 117; Nouv. Dict. d'Hist. Nat. 1st ed. t. 3, p. 453; Latr. Cuv. Regne Anim. 1st ed. t. 3, p. 277; Lamarck, Anim. Sans Vert. t. 4, p. 570; Dumeril, Dict. des Sc. Nat. v. p. 280.

(*Ateuch.*), Fb., Syst. El. t. 1, p. 54; Illig. Mag. t. 2, p. 122; Panz. Schæf. Icon. p. 175; Latr. Hist. Nat. t. 10, p. 94; Genera, ii. p. 77; Crust. et Ins. i. p. 553; Germar, Reis. Nach. Dalm. p. 183; Suckow, Naturg. p. 204; Boit. Man. i. p. 314; Guerin, Icon. du Regne An. pl. 21, f. 2, det.; Dict. Pitt. d'Hist. Nat. i. p. 324, pl. 33, f. 3; Casteln. Hist. Nat. ii. p. 63.

(*Actinophorus*), Panz., Symb. Ent. i. p. 56, pl. 6, f. 3; Duftsch. Faun. Austr. i. p. 159.

corsicus, Latr., Dej. Cat. 3rd ed. p. 150.

crenatus, DeGeer, Mem. Ins. vii. p. 638, t. 47, f. 18; Retz. Spec. 123, 739.

degeeri, McLeay, Horæ Ent. i. 2, p. 502.

dufresni, McLeay, Horæ Ent. i. 2, p. 498.

edentulus, Muls., Col. Fr. Lamell. p. 46 (1842).

impius, Fb., Syst. El. i. p. 55.

inermis, Muls., Col. Fr. Lamell. p. 46 (1842).

platychilus, Fisch., Ent. Russ. ii. p. 211.

striatus, Dej. Cat. 3rd ed. p. 150.

var. *tmolus*, Fisch., Ent. Russ. i. p. 140, pl. 12, f. 1, 2.

var. *peregrinus*, Kolbe, Arch. f. Nat. lii. i. p. 184, pl. xi. f. 26.

Medit. Region; Spain; Fr.; Barbary; Morocco; Asia Minor; Sicily, &c.; S. Russia (Sebastopol); Corea.

81. *semipunctatus* (*Scar.*), Fb., Ent. Syst. i. 63, 207; Panz. Faun. Germ. 67, 6; McLeay, Horæ Ent. p. 504; Muls. Col. Fr. Lamell. p. 50 (1842).

(*Ateuch.*), Fb., Syst. El. i. p. 55; Latr. Hist. Nat. t. 10, 95; Suckow, Naturg. p. 205; Boit. Man. i. p. 304; Casteln. Hist. Nat. ii. p. 65; Schonb. Syn. i. p. 59.

(*Actinophorus*), Sturm., Verz. i. p. 75; Duftsch. Faun. Austr. i. p. 160.

(*Scar.*), *variolosus*, Oliv. Ent. i. 3, p. 151, t. 8, f. 60; (*Copris*), Encycl. Meth. v. p. 171.

var. *subinermis* (*Scar.*), Muls., Col. Fr. Lamell. p. 50 (1842).

var. *substriatus* (*Scar.*), Muls., Col. Fr. Lamell. p. 50 (1842); var. β, McLeay, Horæ Ent. ii. p. 504.

S. Europe; Sardinia; France; Algeria.

82. *typhon*, Fisch., Ent. Russ. ii. p. 210, t. 27, f. 4; Bull. Mosc. 1829, vi. p. 189.

clypeatus, Motsch., Bull. Mosc. 1849, iii. p. 106.

Tartary.

83. *variolosus* (*Scar.*), Fb., Mant. Ins. i. p. 16; Panz. Faun. Germ. p. 67; McLeay, Horæ Ent. i. 2, p. 503.

(*Ateuch.*), Fb., Ent. Syst. i. p. 63; Erichs. Nat. Ins. iii. p. 753; Sturm. Verz. 76, 66.
♀ *morbillosus*, McLeay, Horæ Ent. i. 2, p. 503.
Dalmatia; Barbary; Tunis; Sicily, &c.

ORIENTAL REGION.

84. *brahminus*, Casteln., Hist. Nat. ii. 1840, p. 64; Illiger, Dej. Cat. 3rd ed. p. 150.
India Or.

85. *devotus*, Redtenb., Hügel. Kaschn. iv. 2, p. 515.
India Or.

86. *erichsoni*, Harold, Col. Hefte ii. p. 94 (1867).
India Or.

87. *gangeticus*, Casteln., Hist. Nat. ii. p. 64.

88. *sanctus*, Fb., Ent. Syst. Suppl. p. 34; Syst. El. i. p. 56; Casteln. Hist. Nat. ii. p. 65.
India Or.; Punjab.

89. *wilsoni*, Waterh., Ann. Mag. Nat. Hist. (6), v. p. 366 (1890).
Persia.

ETHIOPIAN REGION.

Since the above was in the press, I have seen a copy of the Annales de la Soc. Ent. Belgique, and find that Fairmaire has described a new species from Somali-land, and mentions the following as occurring in the same district:—*ægyptiorum*, Latr.; *æratus*, Gerst.; *cornifrons*, Cast.; *lævistriatus*, Fairm., Ann. Soc. Ent. Belgique, xxxvii. p. 147 (1893). 1.—Banan; Ouebbi; Abdallah. This species is very closely allied to *lamarcki*.

A. semipunctatus, Fb. The habits of this species are noticed by Berge (C. R. Ent. Belgique, xxvi. p. cxlix); Ponj. (Bull. Soc. Ent. France (6), v. p. cix).

A. sacer, L. Habits and flight discussed by Fabre (Souvenirs Entomologiques, pp. 1–38, 1879); Westwood (Proc. Ent. Soc. 1868, p. xxv.).

A. palemo, Oliv., is identical with *intricatus*, Fb.; while *morbillosus*, Fb., only differs from *intricatus* in having the punctures on the thorax large, coarse, and widely separated; the punctures in *intricatus* being very fine and close together. Lacordaire (Gen. des Coléoptères, iii. p. 68) brackets *palemo* with *morbillosus*, Fb.

A. cicatricosus, Lucas, is very closely allied to, if not identical with, *A. variolosus*, Fb.

The following genus, *Mnematidium*, Ritsema, was inadvertently omitted from my table. It is, however, closely allied, and indeed hardly separable from the true *Ateuchus*, from which it differs in having the body flattened and parallel, the anterior femurs toothed and thickened, and the joints of the tarsi triangular and subequal.

Lansberge founded the genus *Octodon*, in which he placed *Ateuchus multidentatum*, Klug, but, owing to the name being preoccupied (Mammalia), Ritsema changed it to *Mnematidium*. Bedel, evidently not having seen Ritsema's name, called it *Neoctodon*, which however cannot stand. Lansberge's description of the genus reads thus:—"Qui se compose des espèces à corps aplati et parallèle, à cuisses antérieures dentées à écusson apparent et à articles des tarses triangulaires subégaux."

MNEMATIDIUM, *Ritsema*.
Tijds. voor. Ent. xxxi. p. 207 (1889).
Octodon, Lansberge, Ann. Soc. Ent. Belg. xvii. p. 183.
Neoctodon, Bedel, L'Abeille, xxvii. p. 283 (1892).
multidentatum, Klug, Symb. Phys. v. t. 41, f. 3.
  interruptus, Dej. Cat. 3rd ed. p. 150.
Hab. Syria.

NOTE ON *EUMESTLETA*, BUTL., &c.; A GROUP OF NOCTUÆ OF THE *EUBLEMMINE* TYPE.

By A. G. Butler, Ph.D.

I founded this genus ('Entomologist,' xxv. 189) for the reception of *Anthophila flammicincta*, Walk., and allies; it has the general aspect of *Mestleta*, and agrees with it in leg structure. At the time when I indicated this group and the species referable to it, the allied genus *Mestleta* was placed among the Deltoid moths, and therefore I naturally concluded that if one group was rightly placed there, the other ought to follow. Mr. Hampson has subsequently shown that *Mestleta* is a genus of true Noctuæ allied to *Tarache* and neighbouring genera, and not a Deltoid. My natural conclusion, based upon a false foundation, therefore naturally falls to the ground.

How Prof. Smith failed to see our series of twelve specimens of this species, I do not understand. The genus was arranged long before he examined the collection and in the *Eublemmine* group, from which I never removed it, but to which I subsequently transferred *Mestleta* and allies.

Eumestleta differs from *Mestleta* in its palpi, the second joint of which is shorter and more densely fringed in front, making it distinctly broader, and in the long fringes to the middle and posterior tibiæ. In pattern it is very similar.

The structure of the legs in "*Thalpochares mundula*" and "*T*[illegible]*lpis*" is very dissimilar, and the pattern and coloration [illegible]y resemble those of many species of *Metachrostis*.

I have to thank Mr. Kirby for assisting me in working out the type of *Thalpochares*, Led. The case stands thus:—Lederer indicated his genus (Verhandl. zool.-bot. Ver. v., 1855, p. 267), and gave *T. ostrina*, Hüb., and *T. parva*, Hüb., as types. In his subsequent description he included all species previously recorded under *Anthophila* and *Micra*. His first action, nevertheless, must necessarily stand.

Hübner, in his 'Verzeichniss,' p. 256, had already indicated, as types of his genus *Eromene*, *E. ostrina*, Hüb., and *E. parva*, Hüb.; so that the two genera *Thalpochares* and *Eromene* are absolutely synonymous.

Following *Eromene*, stands Hübner's genus *Trothisa* (types, *T. paula*, Hüb., and *T. minuta*, Hüb.). Lederer observes that "Herrich-Schäffer changes the name to *Trothisa*, Hübner; Hübner's genus *Trothisa* consists, however, only of two species, *paula* and *minuta*; the remaining species are separated by him into several other genera,"—a singular reason for ignoring a genus!

Thalpochares, in its later and extended signification, would fall to *Eublemma*, which precedes both *Porphyrinia* and *Eromene* in Hübner's 'Verzeichniss.'

The only species of *Eublemma* which bears the slightest resemblance to *T. mundula* and *latipalpis* in coloration and pattern is my *E. hypenoides*; but in structure the latter species is very distinct, both the palpi and legs being more slender and quite naked of hairs, whereas in these American species the second joint of the palpus is very broadly fringed, distinctly more so than in *Eumestleta flammicincta*. This would indicate affinity rather to *Microphysa jucunda* than to any species of *Eublemma* (the species of which genus have the palpi either smooth or coarsely scaled, but never distinctly fringed).

The uniform colouring of the secondaries and the conspicuous accessory cell of the primaries sufficiently remove these American species from *Microphysa*, whilst the latter character takes them right away from *Eublemma*, but allies them to *Metachrostis*.

I, therefore, refer these species and the allied "*Pyralis*" *plumbealis* of Walker to a new genus, which may be called

OMMATOCHILA, n. gen.,

Smoky greyish moths, the primaries of which are traversed by a darker angular band, edged with black or brown and white; costal margin beyond this band dotted with white, apical and outer margins bounded internally by a series of ocelloid spots; a pale zigzag submarginal stripe, more or less distinct. Secondaries very uniformly coloured, not banded. General aspect of *Metachrostis*, but with the second joint of the palpi broad and fringed in front; antennæ of males finely ciliated. Type, *O. mundula*, Zell.

NOTES AND OBSERVATIONS.

New Species of Ichneumonidæ.—The following two new Ichneumons have been described by Mr. G. C. Bignell, F.E.S., in his address to the members of the Plymouth Institution, and Devon and Cornwall Natural History Society, October 12th, 1893:—

Pimpla bridgmanii, Bignell. Head black; under side of scape of antennæ and palpi, stramineus; antennæ, upper side of thorax and abdomen fuscous, mesothorax darkest; under side, including coxæ, legs, and scutellum, ochraceous; scutellum and adjacent part of mesothorax forming an oblong square patch; hind tibiæ light fuscous, with a ring near the base, and apex dark. Antennæ 25-jointed; length, 3½ mm.; aculea, 1 mm. Length of body, 5 mm. (excluding aculea); expansion of wings, 9 mm. A parasite on spider, *Drassus lapidicolens*, Walckenaer.

Praon absinthii, Bignell. Female: black; mouth and greater part of the abdomen, and terminal joints of tarsi, testaceous; antennæ, third joint wholly, and fourth all but the extreme apex, pectus, legs, apex of the upper side of first segment of abdomen and base of the second, forming an oblong spot, ochraceous. Male: much darker insect; antennæ and pectus black. Antennæ of male with twenty-one joints; female, nineteen. Length, 3 mm.; expansion of wings, 6 mm. A parasite on *Siphonophora absinthii*, Linné; and as figured by Koch, Fig. 272.

Notes on the Cells of Retinia resinana.—Being desirous of learning any facts bearing on the secretion of wax by Lepidoptera, I asked my friend Mr. Clark, of Hackney, to forward me some of the curious cells formed by the larva of *R. resinana*, and he has most obligingly complied with my request. These cells are reported to be soft and wax-like in the earlier stages of formation, but in their mature hardened condition they certainly give one the idea of being purely resinous, that is, that they are the result of vegetable exudation, and not of animal secretion. Still, future examination may prove that wax really *does* enter into their composition. In connection with this subject, the following interesting note occurs in an old work (Molina's 'Chili,' vol. i. p. 147):—"In Coquimbo in Chili, resin, either the product of an insect or the consequence of an insect's biting off the buds of a particular species of *Origanum*, is collected in great quantities. The insect in question is a small, smooth, red caterpillar, about half an inch long, which changes into a yellowish moth, with black stripes upon its wings (*Phalæna cemployeraria*, Molina). Early in spring vast numbers of the caterpillars collect on the branches of the *Chila*, where they form their cells of a kind of soft white wax or resin, in which they undergo their transformations. This wax, which is at first very white, but becomes yellow and finally brown, is collected in autumn by the inhabitants, who boil it in water and make it up into little cakes for the market." This passage is quoted by Kirby and Spence.—H. Guard Knaggs; Folkestone, October, 1894.

Note on Bombyx trifolii.—Besides clover, larvæ of *Bombyx trifolii*, in confinement, will eat walnut, oak, and whitethorn, the last being perhaps the food on which they thrive best. It seems absolutely fatal to remove the pupæ of this species from their cocoons, or even to open the cocoons; in all cases in which this was done, the wings of the perfect insects failed to expand at all. In this matter it is more sensitive than its relative *B. quercus*, which appears to be but little affected by its treatment in the pupal stage.—D. P. TURNER; 14, Havelock Road, Tonbridge.

FOOD OF BOMBYX TRIFOLII LARVA.—In May last I received about a dozen larvæ of the above from a correspondent, and, being the first I ever had, I was very anxious to rear them. I tried them with every kind of clover I could find, but they did not seem to thrive, and I was very much afraid I should lose them. I looked through all my books to try and find out any other food that they would eat. The Rev. J. Seymour St. John's book ('Larvæ Collecting and Breeding') gives broom, but they would not eat that. As a last resource I went into my garden and picked a few leaves off several trees and shrubs, amongst which was sallow. On looking into the cage the next morning, every bit of the sallow was eaten up; after that I gave them nothing but sallow. They fed up well, and I have seven fine specimens. The first emerged on August 1st; the last, on August 22nd. I thought, perhaps, this hint might be of use to some would-be breeders of the above species.—W. E. BUTLER; Hayling House, Reading, Oct. 15th.

CHARÆAS GRAMINIS IN SOUTHERN SCOTLAND.—With reference to Mr. Service's article (*ante*, p. 278), I was collecting a few days at the end of July at Moffat, in Dumfriesshire, and found *C. graminis* very abundant on the heads of thistles; but what struck me as being very singular was, that out of ten specimens netted in the evening nine were females. If the percentage of females in certain seasons is anything like this, one can hardly be surprised that larvæ of this species become almost a plague, as the quantity of ova deposited by *C. graminis* is something enormous.—A. ADIE DALGLISH; 21, Princes Street, Pollokshields, Glasgow, October 1st, 1894.

CHARÆAS GRAMINIS IN SWEDEN.—In connection with Mr. Service's interesting article on this insect (*ante*, pp. 278-282), it is worth while to say that there was an "outbreak" of this species in Sweden in 1892, and Mr. Sven Lampa, the economic entomologist of that country, has published an important article upon it in 'Ent. Tidskr.' 1893, pp. 1-47, plate 1.—D. SHARP.

LARVÆ ON MONKSHOOD.—Referring to Mr. W. M. Christy's remarks (*ante*, p. 294) on larvæ feeding on *Aconitum*, I may remark that in August last, I found several larvæ feeding on the above-mentionnd plant in my garden; they have now emerged, and are *Phlogophora meticulosa.*—W. E. BUTLER; Hayling House, Reading, October 6th, 1894.

MIMICRY OF PHLOGOPHORA METICULOSA.—While walking through Sutton Park this morning, I came across two specimens of *Phlogophora meticulosa* in situations which showed off to the best advantage the large amount of protective colouring this species possesses. One of these moths was a male, the other a female; and although not in any near proximity to each other, they both occupied similar positions. Both were very rich in colour, the darker parts of the fore wings being of a warm olive-green, while the lighter portions were tinged with faint rosy pink; from their fresh appearance both had evidently only recently emerged. I found them clinging to a clump of mixed bramble and heather, intermingled with bracken-fern. They rested with their fore wings closed longitudinally over the hind ones, but their most striking feature was that the costal margins of the former were again folded downwards, and then bent inwards towards the body, making a sort of irregularly crinkled roll on either side of the insect. These little curled-up rolls, together with the bold scalloping of the wing-margins and the thick plumage of the thorax, when coupled with the rich marblings of the fore wings, gave the moths an almost exact resemblance to withering leaves, which harmonized beautifully with the autumnal tints of the real inanimate leaves among which they rested.—A. J. JOHNSON; Baldmere, Sept. 3rd, 1894.

CURIOUS FORM OF SPILOSOMA MENTHASTRI.—I have a specimen of *S. menthastri* in my collection which has a clear brown patch extending over nearly half the area of the right front wing; the veins snow-white, however; the right hind wing, too, is slightly brownish at the hind margin; the antenna on the right side, also, is smaller than its fellow, though perfectly formed. I caught it at light, at Nice (South France), May 28th, 1894. Is the individual in question a hybrid between *S. menthastri* and some other insect; or, how can this condition be accounted for?—FRANK BROMILOW; "Selborne," Poole Road, West Bournemouth, October 1st, 1894.

THE SCARCITY OF PIERIS BRASSICÆ IN 1894.—I can fully endorse the remarks of Mr. A. J. Lucas (*ante*, p. 295) respecting the scarcity of this butterfly during the present season. With the exception of what I have reared from last year's pupæ, I do not think that I have seen above a dozen specimens altogether. The same scarcity seems to have also existed on the continent, if a brief tour through France and Switzerland, during the latter part of the summer, can be relied upon as representing the prevailing conditions throughout the season, for I did not see a single specimen of this species in either country, although *Pieris rapæ* was very abundant everywhere.—W. HARCOURT BATH; Birmingham, October 3rd, 1894.

NOTES ON COLIAS EDUSA AND THE FLIGHT OF INSECTS.—Referring to Rev. W. Claxton's remarks upon the flight of *Colias edusa* (*ante*, p. 297), I can thoroughly endorse his observation that this species generally flies from east to west. It is an interesting fact, and one which I have often thought worthy of remark. Why is it? The observations of entomologists have also proved that by far a greater percentage of our Heterocera fly from east to west, and in evidence of this I may point out that as a general rule moths are attracted to light more freely when the light faces east; and again the question must be asked—why? And so with the beetle tribe; one finds *Zabrus gibbus* often in numbers along the west side of corn fields in Germany in the evening, the insect which has done considerable injury to corn crops so often; whilst on the east side of the field one will not find a single specimen, suggesting that the insect has some preference for the west, and has winged its flight from the east. And, again, I have repeatedly remarked that when the glass of a greenhouse slopes towards the east, several dead specimens of *Dyticus* are to be found in the day; doubtless they have been attracted by the glass they so often mistake for water, whilst winging their flight from east to west. Why, then, is the flight of insects generally from east to west?—R. S. Chope.

Callimorpha hera in South Devon.—In August, 1884, I first met Mr. Brooks at Starcross, who showed me two or three *C. hera* which he had captured in that locality. Mr. Waring, of Starcross, had taken it in some numbers years before then, when a boy. I captured my first few the next season, and during repeated visits to that neighbourhood, year after year, have taken it in great numbers, making it my speciality; and in my frequent notes to the 'Entomologist' have steadfastly defended it against the numerous attacks which threw doubt on its authenticity. It is, therefore, a relief to me to find that at last the species seems to be generally acknowledged as British; whence, and at what date, it first made its appearance in England, like many other species, nobody can tell. I notice that in a recently-published number of a professedly leading work on British Lepidoptera the names of several gentlemen, who have captured *C. hera* in later years, are given as proof of its *bona fides*. This is very satisfactory to me, as those gentlemen obtained their first information about the locality, habits, &c., from me. This season has been a very productive one as regards *C. hera*. I stayed at Starcross during the month of August, and had the pleasure of welcoming Mr. H. Robson, who joined me in the second week; and Mr. Porritt, of Huddersfield, later on. We worked with a will, and started in the usual way, beating the hedges in lanes and roads with good results, although many of the specimens taken were not in cabinet order. With Mr. Robson's excellent reflecting-lamp we tried light, but without success. That *C. hera* comes to light I have ample proof, though the time must be about midnight or after. Mr. Porritt and myself have, however, satisfied ourselves that the first natural flight occurs about dusk, when we saw and took them flying over flowers. As there seems to have been some doubt about this point, I think it is worth recording. With regard to its flight in the sunshine, which question has often been put to me, I must say that in Germany *C. hera* is generally found on the slopes among vineyards and in flowery open spaces in woods, and certainly they are often seen flying in the sunshine and sitting on flowers; but in South Devon the insect inhabits hedges, principally in lanes and main roads. I have only occasionally seen one flying, and have always been inclined to think, owing to its extreme shyness, it must have been disturbed by some vehicle, or even a person walking; or they might have been changing their position to some sunnier spot, where they are nearly always found resting. In former years I have found the yellow var. *lutescens* more prevalent, but this season many more of the normal red ones fell to our nets. The yellow form occurs in light and dark shades; but by far the rarest are the orange or terra-cotta tints, which probably are the progeny of yellow and red parents. The species is very widely distributed in South Devon, and, judging from the number of our captures in the different parts, seems to be more abundant farther westward than I formerly found it.—J. Jäger; 180, Kensington Park Road, Notting Hill, Sept. 1894.

Exhibition of Tropical Lepidoptera.—The collection of tropical butterflies and moths exhibited by Mr. Wm. Watkins at 21, Piccadilly, was inspected by H.R.H. the Prince of Wales on October 12th. His Royal Highness expressed his surprise at the extraordinary beauty of the specimens, and cordially thanked the exhibitor for the interesting details he gave concerning them.

CAPTURES AND FIELD REPORTS.

Colias edusa in 1894.—During a stay at Clare, Suffolk, this summer, I saw three specimens of *C. edusa*—a male on Aug. 31st, in a clover-field; another (sex doubtful) on the following day, in the same place; and a male on Sept. 11th, on a rough pasture. — D. P. Turner; 14, Havelock Road, Tonbridge.

On September 30th, at Dorchester, Oxon, I saw, but failed to secure, a single example of this butterfly. It was a rather small male, very fresh and bright, and of a deeper orange colour than usual. — F. W. Lambert; 70, St. Giles, Oxford.

C. edusa has been fairly common on the coast, and a few specimens have occurred inland, near Colchester.—W. H. Harwood; Colchester.

On Sept. 10th I saw a specimen of *C. edusa* just outside Dulwich Park; on Sept. 19th my brother saw one near Croydon. On April 28th last I found a wing (left primary) of *Lophopteryx carmelita* on a fir tree at West Wickham.—T. B. Fletcher; 78, Thornlaw Road, West Norwood, Oct. 19.

Early Occurrence of Hybernia defoliaria.—I can give an earlier date for the capture of *H. defoliaria* than that mentioned by Mr. G. S. Robinson (*ante*, p. 205). I took a female specimen on September 8th near Knutsford, Cheshire, and a male the same night in Dunham Park, Bowdon. —Lionel Stones; Northwood, Seymour Grove, Old Trafford, Manchester, Oct. 10th, 1894. [Mr. W. E. Butler, in 1892, observed this species in the Reading district on Sept. 26th (Entom. xxv. 287).—Ed.]

Plusia moneta near Tunbridge Wells.—It may interest some of your readers to know that I have again had the pleasure of breeding *P. moneta*, but I must confess I have not found it nearly so plentiful this season.—M. M. Phipps; Victoria Road, Southborough, Sept. 19th, 1894.

Ennomos tiliaria in Sussex.—I should like to note the very unusual manner in which these pretty moths have occurred here this year. They were much more common in August (their proper season) than I have ever seen them before, but I found it very difficult to obtain any good specimens; in fact, they had the appearance of being hybernated insects. But now comes the extraordinary part of my story, for on Sept. 19th (quite three weeks after the first lot had died out) they reappeared in as great abundance as before, and this time in perfect condition. They remained with us until Oct. 5th. I have never seen *Ennomos tiliaria* in such profusion—two or three on every lamp—while last year I only saw one during the season. Can any of your readers explain the appearance of the second brood, which to me is a complete puzzle?—Francis R. Bruce; "St. Margarets," Uckfield.

Vanessa c-album in Kent.—I had this morning the satisfaction of taking a fine female example of *V. c-album* in my little town garden; our latest dates of its occurrence are in 1887 and 1882, in which latter year no less than seven specimens were captured near Walmer. The insect is very uncommon and sporadic with us, generally appearing in localities apart and at some distance from each other. — Sydney Webb; Maidstone House, Dover, Oct. 13th, 1894.

Acherontia atropos in Suffolk.—Following upon the report of my friend Mr. Pyett's capture of this moth at Toxford, I have the satisfaction of reporting that three larvæ of this species have passed through my hands during September. All came from one garden at Hadleigh, and were handed me by the occupant. He found them all crawling on a path, and had been exhibiting them as curiosities. In captivity they would not touch potato, and appeared to be gradually dying, and one did eventually die, the other two turning to rather undersized chrysalids on the surface of the earth. They are being carefully tended, but their successful turning is a matter of doubt, to be solved in the future. — Harry C. Grimwade; 1, Cromwell Street, Ipswich, Sept. 24th, 1894.

Sphinx convolvuli in South Devon.—On the evening of Sept. 29th, whilst walking along by the side of a large bed of *Nicotiana affinis*, I saw two specimens of *S. convolvuli*, but failed to capture either. I determined, however, to visit the same spot each evening at twilight, with the hope of seeing them again, and on Oct. 1st I was successful in taking one at 7.30 p.m., which proved to be a very fine specimen of the male, and measured 4¾ inches across the wings, having the scarlet markings much exaggerated. Is it not rather late for this species to be on the wing? The specimen has been added to the extensive Colby House collection.— R. S. Chope.

Callidium variabile.—Last July I took some thirty-odd examples of this beetle at Wootton, Berks. They varied considerably, both in size and colour, the testaceous form, however, predominating. The majority were taken at rest in the evening on a number of thick oak branches standing in the corner of a farmyard, the remainder being discovered at night on the trunks of apple-trees growing in an adjoining orchard. — F. W. Lambert; 70, St. Giles, Oxford.

Note on the Season at Chichester.—I never remember such a bad season for Lepidoptera as the past. Of butterflies there were almost none, and moths were nearly as scarce. The first *Lycæna argiolus* which I saw was on May 1st. A few specimens of *Colias edusa* were noticed in September by a friend. I did not see any myself; this may have been due in a measure to the scarcity of clover this year in the neighbourhood. *Anticlea rubidata*, of which I bred a fine series, first began to appear on May 17th, and continued to emerge during June; the insect in a wild state was much delayed this year. The larvæ of *Acronycta aceris* were fairly abundant in August. Sugar was a complete failure, one or two specimens of *Catocala nupta* being the only decent takes. On Aug. 29th I took a fine *Luperina cespitis* at light; the lamps also yielding *Hydræcia micacea*, *Ennomos alniaria* (*tiliaria*), (a fine specimen as late as Oct. 5th), *Plusia chrysitis*, *Eubolia cervinaria*, *Cidaria miata*, and a few common Noctuæ—a sorry record.—JOSEPH ANDERSON, Jun.

LEPIDOPTERA AT CLONBROCK, CO. GALWAY.—Although the weather has been unfavourable during this summer, and moths generally scarce, I have obtained some interesting specimens. In the spring, at sallow, *Tæniocampa gracilis* was very abundant, especially on dwarf sallow (*Salix repens*); on one patch a few yards wide I boxed fifty-four in one night. *T. opima* fairly numerous; Mr. Kane and I took about fifty in all. The moth-trap attracted some fine *Biston hirtaria*, but only one specimen of *Eurymene dolobraria* and *Amphidasys strataria*. Last autumn several *Hybernia rupicapraria* and *aurantiaria* were taken, which I omitted in the list in the March, May, and June numbers of the 'Entomologist' (*ante*, pp. 88, 169, 190.) *Macroglossa bombyliformis* was taken for the first time here, flying over *Lychnis*. At sugar some very melanic specimens of *Aplecta nebulosa* and three quite black *Boarmia repandata* were taken flying. The most important additions to the Irish list, as Mr. Kane informs me, are single specimens of *Ophiodes lunaris*, *Xylophasia scolopacina*, *Leucania turca*, and *Stauropus fagi* (smaller and darker than Mr. Kane's two Kerry specimens), and one larva of the same feeding on birch. These were taken by my gamekeeper in my absence between June 1st and Aug. 1st, with many other less important insects; he brought me also the fragments of one *Hepialus sylvanus*, which he informed me had been eaten by a mouse out of a box lying on a shelf. Owing to illness I have been unable to work myself. The following list contains the rarer insects, and those new to this place:—Single specimens of *Nola confusalis*, *Hylophila prasinana*, *Acronycta menyanthidis*, *Asphalia flavicornis*, *Rusina tenebrosa*, and *Agrotis saucia*; five specimens of *Pterostoma palpina*; several *Triphæna orbona*, Hufn. (*subsequa*, Hb.), very ruddy, resembling Scotch insects. On scabious, one *Noctua dahlii*, and one *Cerastis erythrocephala*, resembling the two which Mr. South kindly identified for me as an intermediate form between the type and var. *glabra*; single specimens of *Hecatera chrysozona*, *Xylina socia*, *Asteroscopus sphinx* (male), *Plusia interrogationis*, *Habrostola triplasia*, *Chariclea umbra*, *Pericallia syringaria*, *Tephrosia punctularia*, *Cidaria corylata*. One remarkable *Numeria pulveraria* has the central transverse band of the front wings strongly margined with black. Several specimens of *Epunda lichenea*, *Xylina ornithopus*, *Plusia festucæ*, *Bapta temerata*, three *Halia vauaria*, and *Cidaria dotata*, L. (of the latter, Mr. Kane took a perfectly fresh specimen on Oct. 3rd); one *Polia flavicincta* and a specimen of *Xanthia gilvago*. *Cheimatobia boreata* seems to be faily common here. Larvæ have been very scarce all the year, and are very late, three small *Notodonta dictæoides* being found on Oct. 3rd, while *Acronycta leporina* has not yet pupated. I wish to correct errata in my former list, as *Tæniocampa munda* has not occurred here; and the four specimens I took to be *Hadena contigua* have been identified as *H. dissimilis*.—R. E. DILLON; Clonbrock, Ahascragh, Ireland, Oct. 7th, 1894.

RHOPALOCERA FROM BOURNEMOUTH AND DISTRICT.—Since coming to Bournemouth I have seen or taken the following butterflies, *viz.*:—*Colias edusa* (male), taken by a collector in Branksome Chine, Aug. 31st. *Rhodocera rhamni* (male), seen in the Poole Road, Sept. 2nd. *Thecla rubi*, one observed in Alum Chine, July 1st. *Polyommatus phlæas*, on downs at Swanage, Isle of Purbeck, Aug. 15th. *Lycæna ægon*, took a male at Canford Hill Estate, near Parkstone (Dorset), July 9th, and found the species abundant among the heather, two days later, on Canford Heath. *L. icarus*, first captured in Alum Chine, Aug. 8th; ab. *cærulea* (female ab.), Talbot Woods, Aug. 18th, one example; it was also abundant in Branksome Chine. The specimens of this last were as fine and brilliant at least as any I have seen in the South of France. *Argynnis paphia*, one torn, on a bramble near Brockenhurst, in the New Forest, Aug. 2nd. *Vanessa urticæ*, one example seen on some thistles in Alum Chine, Aug. 6th. *V. cardui*, observed in Branksome Park, Aug. 16th. *Satyrus semele*, seen close, settled on a pine-tree in Branksome Chine, July 8th; I subsequently captured nine specimens on Canford Heath, July 11th. *Epinephele ianira*, one; same locality and date as last. *E. tithonus*, took an example in Branksome Park, July 18th. *Hesperia thaumas*, Branksome Park, July 18th. *H. comma*, seen on the Canford Hill Estate, July 9th, and captured a specimen ten days later on Canford Heath. — FRANK BROMILOW; "Selborne," Poole Road, West Bournemouth, Sept. 28th, 1894.

TORTRICES AT NORTHWOOD, MIDDLESEX.—In addition to many commoner species of Tortrices, I have taken the following within a radius of one mile and a half from Northwood Station, on the Metropolitan Railway:—*Leptogramma literana*, one example, August, 1891, in a lane by the side of Moor Park. *Ditula semifasciana*, two larvæ in shoots of sallow, May, 1894. *Hedya servillana*, one specimen flying over a high sallow bush at dusk, June, 1892; I frequently searched for the larva of this species during the spring, but failed to find it. *Sericoris rivulana*, sometimes abundant in a meadow near station now to be let or sold for building purposes. *Orthotænia striana*, in rough fields; scarce. *O. branderiana*, larvæ on grey poplar (*Populus canescens*); not common. *Capua favillaceana*, among beech. *Phoxopteryx lactana*, plentiful among birch. There are two forms of this species both equally common; one has the markings somewhat similar to those of *Pædisca bilunana*, whilst the other resembles *Grapholitha ramella*, and is sometimes confounded with that species. *Grapholitha nisella*, a few specimens beaten out of or flying around sallow bushes. *G. cinerana*, common and sometimes abundant on trunks of grey poplar; this species is less variable than *G. nisella*. *G. germarana*, a few examples flying over high hedges. *Pædisca opthalmicana*, larvæ often plentiful in rolled leaves of grey poplar. *Catoptria albersana*, one or two specimens captured each year, but rarely in good condition; I have been unable to find the larva, although well acquainted with its method of concealment in the leaves of honeysuckle. *Choreutes myllerana*, about a dozen specimens at honeydew on sallows in 1892; I could not discover *Scutellaria galericulata*, the reputed food-plant of the larva of this species, in the district. *Argyrolepia hartmanniana*, a few specimens each year in damp places on the heaths or commons.—RICHARD SOUTH; Macclesfield, Cheshire.

NOTE ON PERONEA COMARIANA.—This species was fairly common during the autumn among *Myrica gale* on the moss, and at the same time *P. comparana* and *P. schalleriana* were beaten from hedgerows around here. Some specimens of the *Myrica* species resemble small examples ot *P. comparana*, others are like dwarf *P. schalleriana*, and others again appear to agree, except in the matter of size, with a form of *P. comparana* which I cannot see differs materially from *P. perplexana*. These resemblances seem to me remarkable, and certainly do not help one to appreciate the special characters which are said to distinguish *comparana* from *schalleriana*, and *perplexana* from both.—Richard South; Oxford Road, Macclesfield.

Lepidoptera at Light in Swansea District.—I was very interested in Mr. E. F. Studd's note about his moth-trap (*ante*, p. 55), as I have used the illuminated trap for the last two years, and have also found it invaluable. My traps (I have two) were placed in a park facing a wood of beech, birch, oak, &c., one on an elevation under a clump of large elms about 150 yards from the wood, the other under a large oak, also on an elevation, about 20 or 30 yards from the wood, and about a quarter of a mile apart from each other. I believe in placing the traps under trees, as the light appears to be stronger when in the shade, and also the branches keep off the morning sun, which is apt to make the moths inside lively, and consequently harder to box. I also put a piece of old matting on top of the trap, hanging over the front a couple of inches; this also keeps the sun off, and some moths prefer to alight on this in preference to going inside, and are found there next morning. A dark night is, of course, necessary, and the less wind the better. On some nights one of the traps would be full, while the other was comparatively empty, which is difficult to account for, as they are both facing the same way. I found that 1892 was a much better year for light than 1893. I only had one trap then, and took nearly as many that year with one as I did last year with two. I started one of my traps about the first week in March, but only took a few *leucophæaria*, *multistrigaria*, *progemmaria*, *rupicapraria*, and *cruda*, but failed to get the species I set it for, viz., *C. fluviata*, having taken one the autumn before. About the third week in March moths were more plentiful, as *munda*, *rubricosa*, *gracilis*, *instabilis*, *gothica*, *prodromaria*, *opima*, &c., came to it; and by April 7th they were in full swing, taking on that night 1 *abruptaria*, 3 *lobulata*, 2 *prodromaria*, 7 *munda*, 4 *opima*, 2 *rubricosa*, 1 *illunaria*, 1 *nanata*, 1 *spinula*, 4 *gothica*, 1 *instabilis*, 1 *stabilis*, 2 *cruda*, 8 *progemmaria*, 2 *badiata*, 2 *abbreviata*, 1 *exoleta*, 1 *vetusta*, 1 *multistrigaria*, and 2 *æscularia*. From the 7th to the 16th of April the nights were very cold, with occasional frost, so it was useless to light the traps; the 16th produced 1 *biundularia* (black), 1 *crepuscularia*, 1 *chamomillæ*, 1 *derivata*, 2 *badiata*, 1 *mendica* (male), 1 *dubitata*, *gothica*, *progemmaria*, &c.; the other insects taken during April being *pumilata*, *petraria*, *silaceata*, *vulgata*, *palumbaria*, *porata*, *dictæoides*, *gracilis*, *suffumata*, *pulveraria*, *falcula*, *punctulata*, *triplasia*, *remutata*, and *confusalis*. May produced, besides those already named, *basilinea*, *lunaria*, *menthastri*, *bidentata*, *trilinea*, *impluviata*, *dodonea*, *pudibunda*, *lactearia*, *decolorata*, *palpina*, *tenebrosa*, *pisi*, *thalassina*, *centaureata*, *lubricipeda*, *capsincola*, *nana*, *B. rubi* (female), *morpheus*, *dolobraria*, *dentina*, *plagiata*, *exclamationis*, *bucephala*, *unidentata*, *russata*, *cinerea*, *festiva* var. *bilinea*, *corylata*, *L. comma*, *pulchellata*, *carpophaga*, *viretata*, *fagi*, *plecta*, *batis*, *lacertula*, *affinitata*, *cucubali*, *ribesiaria*, *lariciata*, *propugnata*, *impura*, *ruberata*, *corticea*, and *oleracea*. During June and July (I was away from June 12th to July 8th) I took *lunaria*, *rurea*, *margaritaria*, *notata*, *batis*, *imitaria*, *pulchrina*, *cytisaria*, *pudorina*, *cucullatella*, *alsines*, *graminis*, *spinula*, *illunaria*, *comitata*, *crepuscularia*, *centaureata*, *tiliaria*, and *immanata*, which I consider a very bad record. In August things began to look up a bit, as I consider this one of the best months for light. I did not begin lighting till the 9th, the evenings being unfavourable up to that time; but on that date I took *diluta*, *rufa*, *testacea*, *plagiata*, *spinula*, *tenebrosa*, *N. rubi*, *xanthographa*, *ocellata*, *illunaria*, *pumilata*, *russata*, *fluctuata*, *graminis*, *pyramidea*, *brassicæ*, *rumicis*, *H. sylvanus*, *nictitans*, *cespitis*, *palpina*, *micacea*, *falcula*, *erosaria*, and *fulva*; the other moths taken during the month being *propugnata*, *galiata*, *chrysitis*, *G. flavago*, *cerago*, *ferrugata*, *popularis*, *capsophila*, *unidentata*, *testata*, *variata*, *pallens*, *exanthemaria*, *plecta*, *c-nigrum*, *cubicularis*, and *neglecta*. September produced *popularis silago*, *cespitis*, *lunosa*, and *fulva*: and October only *pennaria*, *dilutata*, and *oxyacanthæ*.—R. B. ROBERTSON; Coxhorne, near Cheltenham.

DEILEPHILA GALII ON THE EAST COAST.—I am surprised at not seeing any notices of the capture of *D. galii* this year. I took five larvæ, which have changed to pupæ, on the Essex coast; but, though I spent several days in searching many miles of coast, I could find no more. I thought, however, that other collectors elsewhere had very likely been more fortunate. I saw many places where *Macroglossa stellatarum* and *Chærocampa porcellus* had been feeding, but was too late for most of them.—W. H. HARWOOD; Colchester, Oct. 20th, 1894.

NOTES ON THE SEASON AT COLCHESTER.—The season here has not been a very good one, though a distinct improvement upon last year; for then, though some species were unusually common, they were also very constant in colour and markings, whereas this year variation has been much more rife. The best insect I obtained was a pale, almost white, *Epinephele tithonus*, in absolutely perfect condition; this was captured by one of my sons, and we also took a series of other interesting forms of this species. *Argynnis euphrosyne*, too, proved to be worth looking after; but *A. selene* and *A. adippe* were much scarcer than usual, and very constant, except that some specimens were extremely small. *E. ianira* was extremely variable, and several good bleached and mottled forms turned up. *Zygæna filipendulæ*, which seemed all but extinct last year, was again to be seen in some numbers, though by no means in its usual abundance, and I was fortunate enough to capture five fine pale specimens.—W. H. HARWOOD.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*October* 3*rd*, 1894. The Right Honble. Lord WALSINGHAM, M.A., LL.D., F.R.S., Vice-President, in the chair. Mr. Alick Marshall, of Bexley, Kent, was elected a Fellow of the Society. Mr. W. F. H. Blandford exhibited specimens of a sand-flea, chigoe or nigua, received from Mr. Szigetváry, of the Imperial Maritime Customs, China, who had found them in the ears of sewer-rats trapped at Ningpo. Mr. Blandford stated that the species was allied to, but not identical with, the American species, *Sarcopsylla penetrans*, L., one of the most troublesome pests in Tropical America and the West Indies to man and various domestic and wild animals, the female burrowing into the skin, usually of the feet, but also of any other accessible region. He said that the distribution of the chigoe was recorded over Tropical America and the Antilles from 30° N. to 30° S., and of late years it had established itself in Angola, Loango, and the Congo. Colonel Swinhoe, Mr. McLachlan, Lord Walsingham, Mr. Champion, Mr. J. J. Walker, Mr. Barrett, and others took part in the discussion which ensued. Mr. F. C. Adams exhibited a specimen of *Mallota eristaloides*, a species of Diptera new to Britain, taken by himself in the New Forest on the 20th July last. He said that the species had been identified by Mr. Austen, of the British Museum, and that he had presented the specimen to the National Collection. Mr. Verrall made some remarks on the species and on the distribution of several allied species in the United Kingdom. Lord Walsingham, as a Trustee of the British Museum, expressed his satisfaction at the presentation of the specimen to that Institution. Mr. Tutt exhibited specimens of a form of *Zygæna exulans*, well scaled, and with the nervures and fore legs of a decidedly orange colour, collected during the last week in July by Dr. Chapman in the La Grave district of the Alps, at a considerable elevation; also specimens of the same species taken by Dr. Chapman near Cogne, and others from the Grauson Valley, the females of which were less densely scaled. He also exhibited Scotch specimens for comparison, and stated that he was of opinion that the latter were probably as densely scaled as the continental ones, but that, owing to the differences in the climate of Scotland and Switzerland, collectors had fewer opportunities of getting the Scotch specimens in good condition. Mr. P. M. Bright exhibited a remarkable series of varieties of *Arctia menthastri* from N. Scotland, also series of *Liparis monacha* (including dark vars.), *Boarmia roboraria* and *Tortrix picearia*, from the New Forest; *Zygæna exulans* from Braemar; *Noctua glareosa* from Montrose and the Shetlands; *Agrotis pyrophila* from the Isle of Portland, and Pitcaple, N.B.; red varieties of *Tæniocampa gracilis;* and a specimen of *Sterrha sacraria*, taken at light, at Mudeford, in October, 1893; also living larvæ of *Eulepia cribrum*. Mr. J. J. Walker exhibited a living specimen of a large species of Pulex, which he believed to be *Hystricopsylla talpæ*, Curtis, taken at Hartlip, Kent. Mr. Verrall and the Chairman made some remarks on this and allied species. Mr. K. J. Morton communicated a paper entitled "Palæarctic Nemouræ." Lord Walsingham read a paper entitled "A Catalogue of the Pterophoridæ, Tortricidæ, and Tineidæ of the Madeira Islands, with Notes and Descriptions of New Species." In this paper sixty-six species of Lepidoptera belonging to these families were recorded as occurring in the Madeiras, of which thirty were noticed as peculiar to the Islands, twelve as common to the Madeiras and Canaries (of which two were not known as occurring elsewhere), and one extends its range only to North Africa. Over thirty species were added to the list, and one new genus, seven new species, and two new varieties were described. Mr. Jacoby and Mr. Bethune-Baker made some remarks on the species and their geographical distribution. Mr. Blandford read a paper entitled "A Supplementary Note on the Scolytidæ of Japan, with a list of Species."—H. Goss, *Hon. Secretary*.

South London Entomological and Natural History Society.—*September 27th*. E. Step, Esq., President, in the chair. Mr. Auld exhibited a larva of *Phorodesma smaragdaria*, Fb., which had been feeding fourteen months. Mr. Jäger exhibited the series of *Callimorpha* [illegible], taken by him in S. Devon this year, while accompanied by

Messrs. H. Robson and G. T. Porritt. The red, yellow, and terra-cotta forms were all represented. Mr. Winkley, two specimens of a second brood of *Smerinthus populi*, L., bred this year. Mr. Filer, long series of bred *Papilio machaon*, L., from Cambridge, one specimen having the marginal band of the hind wing extended so as to unite with the discoidal spot. Mr. H. Moore, a specimen of *Vanessa urticæ*, L., from Vienna, having the two spots only represented by a few dark scales. Mr. Williams, a specimen of the intestinal worm, *Gordius aquaticus*, which had emerged from the body of a water spider. Mr. A. Hall, about twenty species of Rhopalocera from Japan, identical or almost identical with British species, including *Papilio machaon*, L., *Leucophasia sinapis*, L., *Gonopteryx rhamni*, L., &c. Mr. T. W. Hall, a long series of *Melanippe fluctuata*, L., from Perth, one being ochreous, many dark, and several were var. *neapolisata*. Mr. Adkin, *Zygæna exulans*, Hock., from Braemar; *Sesia scoliiformis*, Bork., from Rannoch; light and dark forms of *Abraxas grossulariata*, L., and grey forms of *Melanippe fluctuata*, L., from Aberdeen. Mr. West (Greenwich), on behalf of Mr. Tugwell, a large number of *Zygæna exulans*, Hoch., taken this year at Braemar, with cocoons *in situ* on crowberry. Mr. Tutt made some very interesting remarks on the different climatal conditions which the same species of Lepidoptera experienced in the High Alps and in our own country, and noted various modifications of habits resulting therefrom.

October 11*th*.—The President in the chair. Mr. E. H. Trenerry, of Clapham Park, was elected a member. Mr. Oldham exhibited, from his garden at Woodford, a very varied series of *Triphæna pronuba*, L., series of *T. orbona*, Hufn., and a few *Plusia gamma*, L. Mr. R. Adkin, on behalf of Mr. South, series of *Pædisca sordidana*, Hb., *Peronea hastiana*, L., *P. comparana*, Hb., *P. comariana*, Zell., and *P. schalleriana*, L., from Macclesfield, and read notes (a long discussion took place on the perplexities in differentiating the last three species); on behalf of Rev. J. G. Greene, a series of well-executed coloured drawings of the most striking vars. of *Abraxas grossulariata*, L., bred by him during the last few years, and read notes; and on behalf of himself, series of *Acronycta rumicis*, L., from many localities, and a bred series of *Eupithecia jasioneata*, Crewe, from Ireland, and read notes. Mr. Mansbridge, long varied series of *A. grossulariata* and *A. sylvata*, from Yorkshire, and contributed notes. Mr. H. Moore, a female *Lycæna corydon*, Fb., with male coloration, and specimens of *Bombyx quercus*, L., *Catocala nupta*, L., and *Ocneria dispar*, L., with a batch of ova of the last species, all from France. A long discussion on *O. dispar* ensued. Mr. McArthur, series of *Toxocampa craccæ*, Fb., *Noctua glareosa*, Esp., *Acronycta rumicis*, L., and *Agrotis agathina*, Dup., all from N. Devon. Mr. C. A. Briggs exhibited types of *Plusia ni*, Hb. Mr. Tutt, a narrow-winged specimen of *Eupithecia subnotata*, Hb., *Agrotis ripæ*, Hb., from St. Anne's-on-Sea, and two specimens of *Eupithecia subfulvata*, Haw., var. *oxydata*, Tr. Mr. Fenn, series of *Cirrhædia xerampelina*, Hb., from the Isle of Man, and series or examples of *Aporophyla australis*, Gn., *Epunda lutulenta*, Bork., *E. lichenea*, Hb., *Anchocelis lunosa*, Haw., *Calocampa vetusta*, Hb., and *Xylina semibrunnea*, Haw., all from Deal. Mr. Tugwell and Mr. Tutt exhibited a large number of Scotch and Swiss specimens of *Zygæna* *exulans*, Hoch., and contributed papers thereon. A considerable discussion ensued.—Hy. J. Turner, *Hon. Report Secretary.*

Birmingham Entomological Society.—*September 17th*, 1894.—Mr. G. H. Kenrick, F.E.S., President, in the chair. Mr. Valentine Smith, Wellington Road, Edgbaston, was elected a member of the Society. Exhibits:—Messrs. R. C. Bradley and C. J. Wainwright, a collection of insects made during ten days spent in the New Forest in the middle of July this year; the Lepidoptera included freshly emerged specimens of *Lithosia mesomella* and *Erastria fasciana*, which were thus a full month late; also *Cleora glabraria*, *Calligenia miniata*, &c.; eleven species of dragonflies; and a number of Aculeate-Hymenoptera, including *Ammophila sabulosa*, *Crabro vagus*, and *cribrarius*, &c.; but the chief part of the collection consisted of Diptera—*Alophora hemiptera* and *Echinomyia grossa* in good series, one specimen of *E. lurida*, also *Myiolepta luteola*, *Laphria marginata*, *Dioctria reinhardi*, *D. flavipes*, *Limnobia bifasciata*, and many others not yet fully identified, including one *Dicranomyia* taken by Mr. Bradley, belonging probably to an undescribed species. Mr. E. C. Rossiter, a fine collection of Lepidoptera taken during a month's collecting in July at Brockenhurst, including *Triphæna subsequa*, *Cleora glabraria* and *lichenaria*, *Macaria alternata*, and long series of the species more usually met with. Mr. R. G. B. Chase and Mr. W. Harrison, New Forest captures; the former, series (bred this year) of *Limenitis sibylla*, *Apatura iris*, &c.; and the latter, insects captured in former years, including *Selidosema plumaria*. Mr. E. C. Rossiter, *Asthena blomeri*, *Cymatophora fluctuosa*, &c., from Arley, and a series of *Hepialus velleda* from Clent, where he said it had occurred more freely than usual this year, but the specimens were much smaller. Last year he took only a few, but much larger. Mr. C. F. Haines, insects taken thirty years ago by his father, including *Cymatophora octogesima*, from Bewdley.—Colbran J. Wainwright, *Hon. Sec.*

Lancashire and Cheshire Entomological Society.—*October 8th*, 1894 (opening meeting of the winter session). Mr. S. J. Capper, F.L.S., F.E.S., in the chair. Mr. C. S. Gregson stated that *Orgyia fascelina*, which he supposed had been exterminated from the sandhills, was in profusion at Formby in the larval state. Mr. Percy Bright, of Bournemouth, made some interesting remarks on a case of Lepidoptera which he had collected and brought with him for exhibition, including a series of a smoky form of *Spilosoma menthastri* from the North of Scotland, fine series of *Zygæna exulans* and *Crambus furcatellus* taken by himself this year at Braemar, *Sesia scoliiformis* from Rannoch, *Crambus myellus*, dark forms of *Liparis monacha* from the New Forest, and *Tortrix picearia* from the same locality, a dark well-marked specimen of *Noctua glareosa* from Montrose, and a chalky variety of *Syrichthus alveolus* from the New Forest. Mr. F. N. Pierce read a short note respecting the genitalia of two specimens of *Bombyx quercus*. During the evening the President exhibited a fine series of *Calymnia trapezina*. Mr. Gregson, specimens of *Lithosia sericea*, taken by himself this year, *Melanippe hastata* var. *hastulata* from Sutherlandshire, and varieties of *Arctia caia*, bred by himself this year. Mr. C. E. Stott, on behalf of Mr. H. S. Clark, of the Isle of Man, two specimens of *Sphinx pinastri*.—F. N. Pierce, *Hon. Sec.*

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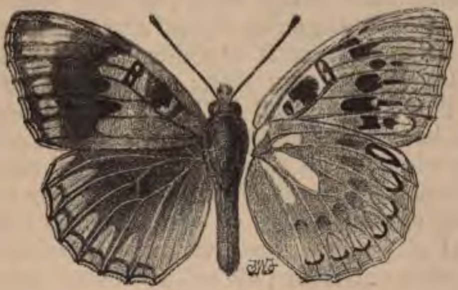
A VARIETY OF *ARGYNNIS AGLAIA*, L.

By Boris N. Menshootkin.



Among the Lepidoptera captured this year near Louga (Government of St. Petersburg) was a variety of *A. aglaia* which seems to me to be quite new. I had the good fortune to take it on the 18th of July. The form perhaps also occurs in other places, but so far I have not found a description of it anywhere.

In general appearance it is very striking, the specimen being almost entirely black, as will be seen from the accompanying figure. The specimen was quite fresh, and appeared to have only shortly left the pupa; it is now in the University's collections. The following is a description:—

Upper surface:—Fore wings are coloured as in ordinary *A. aglaia;* black spots, except in the discoidal cell, are not individually to be seen. The marginal line is very thick, and represents a black band rather than a line; the light spaces between the marginal line and so-called "marginal lunules" are absent, and the lunules themselves and the marginal line have merged together; therefore giving the latter the aspect of a band. In the submarginal area a broad black belt occupies all the space between the marginal and submarginal rows of black dots of the ordinary *A. aglaia*. The base of the fore wings has a deeper colour than the other brown parts of the wings. In the discoidal cell the spots number three; the first (counting from the base) is of ordinary form; the typical second and third have merged together, forming a large, black, irregular spot; between the first and second the yellowish ground colour forms a capital L; the last (third in the variety) is larger than it ought to be, and is somewhat like the capital letter B. The nervules in the marginal area are black, and very broad as compared with the basal part, where they are of just the same aspect as in the typical specimens.

Hind wings—Marginal area:—The marginal line and the lunules are typical; but the marginal row of dots fails altogether, or is merged with the broad black belt; compared with the figure of *A. aglaia* var. as described by Mr. Fowler,* it will be seen that the pale spots of my variety are exactly in the places of the "seven broad black bars" of the secondaries of his variety. The whole of the submarginal area one broad black band; the nervules that traverse it are much paler than the general colour, and therefore easily seen; the same with the marginal area, where they are encased in broad black lines. The black spot near the base of the wing has not the typical prolongation, and is on the whole much smaller; being surrounded by black it is not very distinct. The base is almost entirely black.

The under surface differs as much as the upper from that of the typical *A. aglaia*. Fore wings:—Marginal area without black spots, with only four pale yellow round dots and two long silvery bars at the tip of the wing, corresponding to the two long pale spots (fifth and sixth) of the marginal area of the upper surface. The submarginal area has two rows of black spots; the row nearest to the base is formed by six large and broad spots, about twice as large as the typical ones; the outside row by four spots, of elongated form, except the last, which is round. The discoidal cell has only three spots,—first small, second and third merged together, fourth like capital B, of exactly the same form as on the upper surface. Nervules typical.

The hind wings have in all only eleven silvery spots, instead of the typical twenty-one. The marginal area has distinct marginal lunules and seven spots, which have a little silver in them, and are horse-shoed on the marginal side with black. The last spot is elongated, silvery, and surrounded by a black border. The submarginal area is utterly devoid of silver spots; in place of them are spots of a reddish brown hue, seven in number; they are represented on the figure as darker than the ground colour, which is typical. The basal area has only four large silver spots, just like the var. *charlotta*. Nervules distinctly seen.

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* *Ante*, p. 131, and fig. on p. 182.

As will be remarked, this variety has the following particular in common with the variety of *A. selene*, previously described by me (*ante*, p. 183): both have much more black than the typical forms. As black absorbs more heat, may not this be a device to keep the Lepidoptera warm in our cold climate?

St. Petersburg University, August 13th, 1894.

THE NORTH AMERICAN SPECIES OF *INGURA*.

By John B. Smith, Sc.D.

To the notes given by Mr. Butler in the 'Entomologist' for Oct. 1894 (p. 282), I have nothing to add in the way of criticism, and only a few words in explanation. At the time I examined the collection there were arranged of the Noctuidæ nine cabinets of twenty drawers each, and in cabinet 10 there were two drawers completed; making in all 182 boxes looked over, more or less carefully. My notes on this part of the collection refer to the number of the cabinet and drawer in which the species annotated were found; and after "Cab. 10, Box 2," I find—"Thus far the collection was arranged." Beyond this point my notes show a constant reference from the Grote boxes to the Museum drawers, and the *Plusiini* were the first to be examined of the unarranged material. In the Grote boxes I found his collection of *Ingura* intact, and I noted the presence of five species, among them the type of *flabella*. This series, then, was certainly not incorporated with the remainder of the Museum material.

After I had been over the entire series of Noctuid boxes, I made in my note-book a list of all the names of the Walker species which I had not then found, to serve as a guide for further search; and in this list I find *I. fuscescens* and *I. producta*. My book then shows that I looked over the Bombycid series, finding a number of species of interest as I proceeded; but here I kept no memorandum of cabinet or drawer number. Among these somewhat random notes I find the references of *I. producta* to *abrostoloides*, and of *I. fuscescens* to *I. præpilata*. Concerning *Edema fuscescens*, which is, as Mr. Butler says, described from Honduras, it was referred to by Messrs. Grote and Robinson as an *Ingura*, and so came upon my list. I have no note of the locality of the specimen seen by me, and no special comment on the species, except that it equals *præpilata*. I did not see *I. cristatrix*, and probably, therefore, not the real type of *fuscescens* if the two were associated. It is pleasant to learn that *cristatrix* can be dropped from our list, and I am quite convinced that Mr. Butler is right about *pygmæa*. In other words, I accept Mr. Butler's conclusions in this genus.

ON A *LECANIUM* FROM ROCHESTER, N.Y. (U.S.A.), CONSIDERED IDENTICAL WITH *L. JUGLANDIS*, BOUCHÉ.

By T. D. A. Cockerell.

Entomologist of the New Mexico Agricultural Experiment Station.

About fifty years ago, Bouché, who was Director of the Botanic Garden at Berlin, described various Coccidæ which came under his observation. One of these, which occurred in Germany on *Juglans nigra* and *J. regia*, is the above-mentioned *Lecanium juglandis*. Signoret, in his famous 'Essai,' was obliged to quote Bouché's description, never having met with the species himself. He remarked, however, that he thought *L. juglandifex* of Fitch, though American, was the same species.

Turning now to Fitch's writings, we find, in the Trans. N.Y. Agr. Soc. for 1856, p. 463, a description of *Lecanium juglandifex*, n. sp., the Butternut scale-insect. A comparison of this description with that of Bouché, as quoted by Signoret, seems convincing as to the identity. I will give the characters cited in parallel columns, using for *juglandis* a translation written by my wife:—

L. juglandis, Bouché.	*L. juglandifex*, Fitch.
♀ oblong, convex, of a grey-brown with yellow bands, and the dorsal line yellow. Length 2 lines. This cochineal much resembles *L. persicæ*, but it is still larger. The females end by becoming formless, with much elevation, and are 2–3 lines in diameter.	[♀] Hemispheric, dull yellowish or black, about 0·22 long and 0·18 broad, notched at hind end, frequently with paler stripe along middle, and paler margin with transverse blackish bands.
[♂] pupa is oblong, depressed, whitish, a little striated.	♂ pupæ are oblong oval, moderately elevated white scales about 0·10 long and half as broad, thin and somewhat hyaline, with a slender snow-white line running lengthwise along each side of the middle, and uniting posteriorly, with a similar line transversely across the scale half-way between middle and hind end.
♂ of a deep reddish brown, with blackish head, the wings whitish, the anterior edge red, shaded as far as the first nerves, the tails white. Length ¾ line. The antennæ of the male have knotty hairs at the extremity.	♂ rusty reddish, thorax darker, scutel and head blackish, neck narrowly pale red. Antennæ 8-jointed [error, no doubt, for 10]. Wings transparent but not glassy, vein reddish.

Looking through the 'Zoological Record,' I find *L. juglandis* mentioned in 1878 (Signoret's paper), and again in 1884. It is also recorded from New Jersey in Prof. J. B. Smith's catalogue of the insects of that State. *L. juglandifex* is treated of in Packard's great work on Forest Insects, p. 338.

So much for the published information; now we may turn to the specimens.

A few weeks ago Dr. Lintner sent me specimens of a *Lecanium* thickly infesting a twig of plum. These were from Rochester, N.Y., and the insect was there causing some alarm. The species was new to me, but I came to the conclusion that it could be none other than *L. juglandis*, Bouché (*juglandifex*, Fitch). As remarked by Bouché, it much resembles *L. persicæ*, but it may be very easily distinguished at sight, *if living*, by the markings of the immature female scale, which are as indicated by Bouché in his description. The transverse yellow and blackish bands alternate, so that there is no contradiction between the statements of Bouché and Fitch—the one simply taking the dark, the other the light, as the ground-colour. The individuals vary considerably, and only one here and there is marked as plainly as Bouché describes.

The mature female, as Bouché says, becomes swollen, and loses the colour bands.

The male I did not see, but it will be observed that the two accounts given of it agree sufficiently well.

I wrote to Dr. Lintner explaining how the matter stood, and suggesting that greater certainty might be aimed at, if the type of Fitch's description could be found and examined. He very kindly replied at once by sending me Fitch's type, which was in his care, for study.

On first glancing at this scale, I thought it must surely be different from the Rochester species after all. It is 5 mm. long, rather more than 4 broad, and 2½ high. There is a short posterior notch with contiguous sides, as usual in the genus; but the *anterior* margin presents a deep wide notch, very much wider and deeper than is seen in any of the Rochester scales. The scale is of a red-brown colour, not at all blackish, with three strong dorsal keels, converging posteriorly; and joined at their anterior ends, and again about their middle, by strong transverse ridges. The transverse keels do not extend down the sides, which, however, are strongly rugose-plicate, with pits. The surface of the scale is shiny.

It will be at once seen that this type differs as much from Fitch's description as from the Rochester scales; but the anomaly was explained when, on looking again at the latter specimens, I saw them in their dead and shrivelled condition. The mature females do not alter in shape after death, but all those not mature lose their coloured markings, and become greatly changed in appearance. The shrivelling takes place somewhat differently in different specimens, but I was able to find one which showed the three dorsal keels just as in Fitch's type. The broad anterior notch I did not match, but probably, among a number, some would be found presenting the same character, which is undoubtedly due mainly to contraction in drying. Therefore, having these facts in view, the Fitch specimen may be said to confirm the opinion that it and the Rochester species are the same. It should be stated, however, that none of the immature females from Rochester are so large as Fitch's type.

The occurrence of this *Juglans* scale on plum has its parallel in the case of *Aspidistus juglans-regiæ*, Comst., which has lately been detected on plum and other fruit trees. The parallel is more complete from the fact that *A. juglans-regiæ* seems also to have been described from Europe as *A. juglandis*, Colvée. The probability seems to be that *L. juglandis* is a native of America, but this is very far from proven. It will be remembered that Signoret failed to find it in France.

In order to render the identification of the species somewhat more certain in the future, I have noted the following microscopical characters:—

L. juglandis on plum from Rochester. Antennæ shorter than their distance from the margin, seven-jointed, 3 much longest, then 4; formula 34 (71) 2 (56). I have bracketed 1 as equal to 7, but it is perhaps hardly so long. 1 with a hair; 2 with two long hairs; 3 apparently hairless; 4 with two long hairs and one short one near its distal end; 5 and 6 each with a hair; 7 with about eight long hairs. Legs slender; coxa with three hairs at distal end, two on outer, one on inner side; trochanter with a very long hair; femur about as long as tibia; tarsus about two-thirds length of tibia; claw nearly straight; a very long tarsal knobbed hair, with the knob almost obsolete; digitules slender and hair-like. Margin with very small spines. Stigmatal spines in pairs, rather small. Derm not tessellate, but with scattered gland-spots. Rostral loop short. Anal ring with six stout hairs.

The above was written on June 7th. Since then, the MS. has been sent to Messrs. L. O. Howard, of Washington, and M. V. Slingerland, of Ithaca, N.Y., who had interested themselves in the matter. Some discussion and doubt has arisen regarding the identification of the scale, notwithstanding the facts above set forth, and consequently a few further observations appear to be necessary.

Mr. Howard remarks that he cannot distinguish the Rochester scales from specimens of *L. persicæ*, which had been received from Mr. Newstead. Bouché himself did not fail to note the great resemblance of *L. juglandis* to *L. persicæ*, as above quoted; and I quite expect that if Dr. Lintner had not sent me good fresh material, I should have replied to him that the insect was apparently *persicæ*. While the possibility exists that *juglandis* and *persicæ* are but forms of one species, I think that with present information we must hold them distinct. In the Rochester *juglandis* I found the antennæ but seven-jointed; whereas Signoret gives *persicæ* as having eight joints. Otherwise the antennæ of the two forms are very much alike.

It may be added here, that the antennæ of Fitch's *juglandifex* are likewise seven-jointed, a circumstance which favours the belief that *juglandifex* and the Rochester *juglandis* are the same. This was not stated in Fitch's description, and could not be ascertained from Fitch's type, but appears in specimens found on butternut in New York State, sent by Mr. Slingerland. Mr. Joseph F. Bennett, one of my students, made a careful examination of these specimens, and has drawn up a description. The antennæ are as described above for *juglandis* in all essential particulars, but the fourth joint is possibly not quite so long, so that Mr. Bennett writes the formula 3 (47) 21 (56). The formula also shows 2 somewhat longer than 1, but this results from the position of the segments, as may be seen from the drawing accompanying the description. Practically, one may say that the antennæ of the butternut form (*juglandifex*) and of the Rochester *juglandis* are identical in character.

Another difficulty of quite a different kind has arisen. Mr. Slingerland has very kindly sent me a copy of a paper, by Rudolph Goethe, which I had not seen. In this paper (in Jahrbücher d. Nass. V. f. N., 37) the author describes several species of *Leucanium*, including one found on *Juglans*, which he considers to be *L. juglandis*, Bouché. Mr. Slingerland observes that neither the description nor the figure tallies with the Rochester species, and in this I can entirely agree with him. Goethe's *juglandis* is a large species, shaped almost like a *Kermes*, and appears to be allied to *L. tiliæ*, *L. æsculi*, &c. Whether it is a known species on a new food-plant, or a new species altogether, the description scarcely permits one to decide; but that it is true *juglandis* of Bouché I cannot bring myself to believe. I do not suppose that Bouché's types are still in existence, and, failing these, we must necessarily demand that a species identified as *juglandis* shall agree with his description, which Goethe's scale by no means does.

Goethe goes on to describe *L. persicæ*, but differentiates from it, a few pages further on, a supposed new species, which he calls *L. variegatum*. This species, found on plum, is, to judge from the particulars given and a characteristic figure, none other than our Rochester *juglandis!* Thus we have evidence that this scale, newly found on plum in America, has infested it for at least ten years in Central Europe, Goethe's paper dating from 1884.

To finally sum up, I have to say that it still appears to me that the Rochester scale is *Leucanium juglandis*, Bouché, of which *juglandifex*, Fitch, and *variegatum*, Goethe, are synonyms. This conclusion is not to be considered certain, but simply as favoured by the balance of evidence. Those who disagree have several courses open to them; they can use Goethe's name, *variegatum*, or either *variegatum*, *juglandifex*, or *juglandis* can be used in a varietal sense under *L. persicæ*.

September 24th, 1894.

NOTES ON "ASSEMBLING," WITH SOME GENERAL REMARKS ON THE SENSES IN LEPIDOPTERA.

By J. Arkle.

That butterflies and moths possess a keen sight needs no demonstration; but what evidence is there of the sense of hearing? As far as can be seen they possess no organ for the exercise of the faculty. Sound neither alarms nor produces upon them the slightest impression. A butterfly or moth evades its captor by the sense of sight, not by that of hearing. The report of a gun disturbs birds and other animals but not Lepidoptera. Not only are they insensible to sound, but they are in themselves voiceless. The death's-head moth (*Acherontia atropos*) has been credited with a phenomenal squeak, *Neuronia popularis* with a "clicking noise" in flight; the wings of certain species set up a vibratory hum; but there is no response in a sense of hearing, and the insects live in what is to them a soundless world.

If, however, the sense of hearing be absent, that of touch is certainly present. Whatever other faculty the antennæ may possess, these organs are unmistakable "feelers." Any one who has watched the little bronze-green *Adela viridella* using its long antennæ in a birch-bush on a sunny day, will be convinced that a discriminating touch is centred in these appendages. Antennæ are varied in dimension and design, but surely to meet the habits of each particular species. And so, in contrast to the example quoted, those of *Hepialus humuli* are short, to fit with an experience close to the roots of thick, low-growing plants. To butterflies and certain moths "clubbed" antennæ are best suited in dealing with surfaces, as petals and leaves.

That Lepidoptera generally possess the faculty of taste is as evident as that they possess sight. But in some species, appearing early in the year, as, for example, *Nyssia hispidaria*, the proboscis is wanting and the sense probably withheld. As imagines they precede the flowers, and seem to pass their short lives without food at all.

Smell.—In animal organisms the gift of scent is exercised [illegible]h the respiratory process. Lepidoptera possess this faculty beyond doubt; and, as the air inhaled is the carrying medium, we must look to the spiracles as the organs of smell. In some moths, especially Bombyces and Noctuas, the sense is extraordinarily developed. For instance, "sugar" can be found by the "owl-moths" in the darkest nights. Geometers fly more in the dusk; the flight of butterflies is by day. Neither are therefore conspicuous at sugar. And, if we except species such as *Amphidasys strataria* (*prodromaria*), geometers agree with butterflies in having the sense of smell less developed than, for example, Bombyces. There is nothing extraordinary in this; it is a provision in Nature with which we are familiar. For instance, the greyhound courses by sight; the foxhound by scent. Let us now apply these observations to what is termed "assembling."

When I met Mr. Murray, of Carnforth, last July, he told me he had put three *Bombyx quercus* (females), each confined in a small cage of perforated zinc, into the leather satchel he usually carries when on entomological expeditions. This was on July 19th. In the afternoon of the same day "assembling" was tried on Witherslack Moss. It was late, about five o'clock, a dull day, and, as we afterwards found, few males of the species were out of the chrysalis. Two, however, were attracted and captured. On the morning of the 20th Mr. Murray removed the females from the satchel, and took the satchel with him to the Isle of Man. He returned from the island on the 23rd. On the 24th he again visited Witherslack Moss, and, although no *B. quercus* had been in or near the satchel since the 20th, numbers of males not only came to it but crept inside. The 26th was the date of our visit to Clougha Pike (Entom., *ante* 303), and Mr. Murray then acquainted me with these particulars. His experience was thoroughly corroborated on the occasion of our visit to the Pike; but the species there was nearly over; the males were rubbed, chipped, experienced, and shy. On the 27th we all went to Witherslack Moss, and it was a sight to see the males of *B. quercus*, all in good condition, trooping up against the breeze to the satchel. Again, on the 29th, two fine males came to it, on the high road, by Halton Moss. I took the first—no difficult matter, as satchel and moth were within arm's reach. The second we watched running about and into the bag as we sat at lunch by the well, until we finally chased it away. Lastly, males assembled to the satchel, in a similar manner, on the 31st. Summing up then,—three female *B. quercus*, each in a cage of perforated zinc, were placed in a leather bag on July 19th. On the 20th they were taken out. The bag had a sea trip, but males continued to assemble to it for twelve days afterwards! Clearly this history proves two things:—That Lepidoptera possess the sense of smell; and that some species, at any rate, depend on this sense in "assembling." They are the foxhounds, as it were, in Lepidoptera; they course by scent, as, undoubtedly, butterflies and many Geometers find their mates by sight.

It has been suggested that these insects possess an "additional sense," and that its seat is, probably, the "feathered antennæ." But assembling is evidently habitual in species without these very antennæ (Entom. xxv. 84, 121, 163, 218). It is much more likely that pectinated antennæ are necessary under special circumstances affecting the sense of touch. There is no evidence in favour of an additional sense existing; there is no organ we can point to for its exercise; there is, in short, no need for it.

These remarks are laid before the reader without any claim to infallibility. There are puzzles insoluble throughout Nature; so will there be in insect mechanism. But a generous field has been left for useful research, and it is well we should seek to know more about the things around us than that they are possible results of chance.

Chester, October 31st, 1894.

A NEW CLASSIFICATION OF THE GENUS *PERGA*, LEACH.

By John W. Shipp.

In a paper published in the 'Entomologist' (vol. xxvi. p. 263), I gave a list of specimens belonging to the above genus, which are in the Hope Collection at Oxford. Kirby (List Hym. i. 1882) gives a list of species in the British Museum, including no less than forty-six known forms. This has been further augmented to fifty-one, the species since added being *chalybea*, Froggatt; *sericea*, Kirb.; *sellata*, Kirb.; *lalage*, Kirb.; and *divariata*, Kirb. The most natural classification of the genus is as follows:—

I. Antennæ 6-jointed.
    i. Antennæ shortish, longer than head, joints 3–5 of equal length, not remarkably short.
        A. Species furnished with four submarginal cells in anterior wings.
            a. Species with the 2nd recurrent nervure confluent with the radial nervure between the 2nd and 3rd submarginal cells . . Acanthoperga, n. g.
            b. Second recurrent nervure not confluent, but joining the cubital nervure between the 2nd and 3rd cubital transverse nervures . . . . Perga, Leach.

B. Species furnished with three submarginal cells in anterior wings . . . . . Pseudoperga, Guerin.

ii. Antennæ very short, hardly, if at all, extending past eyes; joints 3–5 so short that the club appears to spring almost immediately from the antennal tubercle; hind femora more or less swollen.

A. Species having three submarginal cells in anterior wings, at least in the males . . . . Pergadopsis, n. g.

B. Species having four submarginal cells in anterior wings . . Camptoperga, n. g.

II. Antennæ seven-jointed, with a gradually formed club.

i. Species having three submarginal cells in fore wings . . . . . Plagioperga, n. g.

ii. Species having four submarginal cells in fore wings . . . . . Xyloperga, n. g.

Acanthoperga, mihi.

cameroni (type). Westwood, P. Z. S., 1880, p. 367, pl. xxxvii. fig. 3; Kirby, List Hym. i. p. 24, 1882; Shipp, Ent. xxvi. p. 265, 1893.

Hab. Australia.

Perga, Leach.

Zool. Misc. iii. p. 115, 1817.

dorsalis (type). Leach, Zool. Misc. iii. p. 117, n. 4, pl. cxlviii. f. 1; Westw., P. Z. S., 1880, p. 362; Kirby, List Hym. i. p. 18, pl. i. figs. 11, 12; Froggatt (larv), P. Linn. Soc., N.S.W. (2) v. p. 284; Shipp, Ent. xxvi. p. 265.

scutellata ♀, Westw., Griff. An. Kingd. xv. p. 402, pl. lxvi. f. 2, 1832; Brullé, Hist. Nat. Ins. Hym. iv. pl. 48, f. 1, p. 674; Guérin (del), Icon. du Règne Anim. Ins. pl. 64, f. 2.

eucalypti, Bennett and Scott, P. Z. S., 1859, p. 209, pl. 62; Kirby, List Hym. i. p. 20.

Hab. Australia; New S. Wales; Queensland; Tasmania.

Pseudoperga, Guérin.

Icon. du Règne Anim. Ins., *teste*, p. 395.

lewisii (type), Westw., T. E. S. i. p. 232, 1836; Arc. Ent. i. p. 23, pl. vii. f. i., 1841; P. Z. S., 1880, p. 374. Kirby, List Hym. i. p. 24, 1882; Froggatt (larv), P. Linn. Soc., N.S.W. (2), v. p. 287; Shipp, Ent. xxvi. p. 264.

Hab. South Australia; Tasmania; Adelaide.

smithii, Westw., P. Z. S., 1880, p. 375, pl. xxxvi. f. 6; Kirby, List Hym. i. p. 24; Shipp, Ent. xxvi. p. 264.

Hab. Australia.

PERGADOPSIS, mihi.

dahlbomii (type), Westw., P. Z. S., 1880, p. 371, pl. xxxv. figs. 3, 4; Kirby, List Hym. i. p. 28; Shipp, Ent. xxvi. p. 266.
Hab. Australia.

guerinii, West., P. Z. S., 1880, p. 367, pl. xxxv. f. 1; Shipp. Ent. xxvi. p. 265.
Hab. Australia.

CAMPTOPERGA, mihi.

cressoni (type), Westw., P. Z. S., 1880, p. 368, pl. xxxvii. f. 1; Shipp, Ent. xxvi. p. 265.
Hab. Swan River, West Australia.

PLAGIOPERGA, mihi.

mayrii (type), Westw., P. Z. S., 1880, p. 378, pl. xxxvii. f. 7; Shipp, Ent. xxvi. p. 266.
Hab. Swan River, West Australia.

jurinei, Westw., P. Z. S., 1880, p. 378, pl. xxxvii. f. 6; Kirby, List Hym. i. p. 29; Shipp, Ent. xxvi. p. 266.
Hab. Swan River, Melbourne.

XYLOPERGA, mihi.

hallidayi (type), Westw., P. Z. S., 1880, p. 377, pl. xxxvii. f. 5; Kirby, List Hym. i. p. 30; Shipp, Ent. xxvi. p. 266.
Hab. Australia, Adelaide.

P. schiodti, Westw., is referred to *latreillei*, Westw. (Froggatt, *l. c.*, p. 287), and the larva described.

He also describes a new species, *P. chalybea*, Frogg. (p. 285), from South Australia, together with the larvæ. In the same paper are notes upon the habits and descriptions of larvæ of *fœrsteri*, Westw. (p. 288), *lewisii*, Westw. (p. 287), and *polita*, Westw. (p. 285).

In the Ann. Mag. Nat. Hist. (6), vol. xii., 1893, p. 38, Kirby describes the following species from Melbourne:—

P. divaricata (p. 39), probably, owing to its short antennæ and three submarginal cells, referable to *Pergadopsis*, mihi; *sericea* (p. 40), probably a *Pseudoperga*, Guér.; *sellata* (p. 40), a true *Perga*, and (*Xyloperga*) *lalage* (p. 41).

ON *PARNASSIUS PHŒBUS* (FAB.) = *DELIUS* (ESP.), AND *P. SMINTHEUS* (DOUBLEDAY).

By JOHN WATSON.

Parnassius smintheus (Doub.) is found only in the Rocky Mountains of Utah, Colorado, and Nevada, whilst *P. phœbus*, of which *smintheus* is considered a form, is found in Europe and

Central and Eastern Asia. It has seemed to me a doubtful case as to the two insects being one species. I have had a good number of *P. smintheus* collected for me in the Rockies of Colorado, Nevada, and Utah, and on comparison with *P. delius* (Esp.) = *phœbus* (Fab.) they show constant differences as follows:—

1. *Phœbus* has a more rounded contour of primaries in both sexes, the costa of primaries of *smintheus* being straight for two-thirds its length, unlike *phœbus*, which is slightly arched from base to tip; apex of primaries of *smintheus* much more pointed, to a greater degree in male than in female examples.

2. Palpi and head of *smintheus* clothed with pale golden hairs; *phœbus* with fewer, longer, and coarser dark grey ones.

3. Wings of *phœbus* more diaphanous; more pronounced at the outer margins.

4. Fringes at the terminations of the nervures, and all black markings, on *smintheus* more emphasized, and particularly a row of semilunar dark spots forming a decided band outside the cell on primaries, and in a less degree on secondaries, of both sexes of *smintheus*; those on secondaries very much pronounced in the female, less in the male, and in female and male *phœbus* almost absent. Ground colour of all wings of *smintheus* paler. The black patch of anal margin of secondaries running round the anal and lower edge of discoidal cell, most noticeable in females. I have two females where it spreads over a very considerable portion of cell, almost meeting a part of this band, which runs out along the upper and costal edge of the cell.

5. Antennæ of *phœbus* gradually swelling from half its length to the club. Shaft slightly stouter. Antennæ of *smintheus* abruptly clubbed, the club thicker at its greatest diameter than *phœbus*; club occupying only one-third or less of the antenna. Shaft more slender than *phœbus*.

6. Body and anal margins of secondaries of *phœbus* more strongly clothed with hair than *smintheus*.

When I have a greater number of pouched females of *phœbus*, I shall carefully examine them; I have but two by me, and these show a slight difference between themselves; but one slight character they have in common, which I fail to notice in seven pouched females of *smintheus*. The anterior end of the keel seems to end in a ram (if one may still keep to nautical terms); I do not, however, place much faith in this, as both specimens may have been taken *in coitu* before the complete development of their pouches, and the anterior projection may be the point of the keel at which the additions of the pouch-forming fluid were communicated to the growing keel. However, I think enough has been written to show the distinctions of the two forms, especially when one considers the isolated habitat of *smintheus* along with the other characters. That they are closely allied I do not doubt; that they are both one species I canno' admit.

ADDITIONS TO THE LIST OF BRITISH LEPIDOPTERA DURING THE PAST TEN YEARS.

LYCÆNIDÆ.
Lycæna argiades, Pall.; Entom. xviii. 249; Proc. Dors. N. H. & A. F. C. vii. pl. v.

HESPERIIDÆ.
Syrichthus alveus, Hb.; E. M. M. xxviii. 244.
Hesperia lineola, Ochs.; Entom. xxiii. 8.

SESIIDÆ.
Sesia conopiformis, Esp.; Entom. xxvii. 245.

NOTODONTIDÆ.
Notodonta torva, Hb.; E. M. M. xxiii. 276.

CARADRINIDÆ.
Caradrina superstes, Tr.; Brit. Noct. vars. i. 148.
taraxaci var. ?.

ORTHOSIIDÆ.
Xanthia ocellaris, Bork.; E. M. M. xxx. 111, 161.

CATOCALIDÆ.
Catocala electa, Bork.; Entom. viii. 282; E. M. M. xxix. 64.

PLUSIIDÆ.
Plusia moneta, Fab.; Entom. xxiii. 287, pl. iii. fig. 6.

HYPENIDÆ.
Hypena obsitalis, Hb.; Entom. xvii. p. 265; Proc. Dors. N. H. & A. F. C. vi. pl. iii.

ACIDALIIDÆ.
Acidalia humiliata, Hufn.
osseata, Hb. (non Haw.); E. M. M. xxix. 65.
Acidalia immorata, L.; Entom. xx. 290 (fig.); E. M. M. xxiv. 133.

PYRALIDÆ.
? Hercyna phrygialis, Hb.; E. M. M. xxviii. 264.

BOTYDÆ.
Botys repandalis, Schiff.; E. M. M. xxiii. 145; Entom. xxiii. 275, pl. iv. fig. 6.

CRAMBIDÆ.
Crambus salinellus, Tutt, Entom. xx. 56; xxiii. 298.

PHYCIDÆ.
Epischnia bankesiella, Richardson; E. M. M. xxv. 63; Entom. xxiii. 335, pl. iv. fig. 7; Proc. Dors. N. H. & A. F. C. x. pl. fig. 1.
Ephestia kühniella, Zell.
kühniella, Entom. xxiii. 329, pl. iv. fig. 2.
Euzophera oblitella, Zell.; E. M. M. xxiii. 233; Entom. xxiii. 330, pl. iii. fig. 2.
Cateremna terebrella, Zk.; E. M. M. xxiii. 82; Entom. xxiii. 333, pl. iii. fig. 12.
Dioryctria splendidella, H.-S.
Nephopteryx splendidella, E. M. M. xxiv. 269; Entom. xxiii. 332.

GALLERIDÆ.
- ? *Melissoblaptes gularis*, Zell.; Entom. xxv. 286.

TORTRICIDÆ.
- *Tortrix decretana*, Tr.
  - *Lozotænia decretana*, Tr.; E. M. M. xxiv. 125.

GRAPHOLITHIDÆ.
- *Grapholitha gemmiferana*, Tr.; E. M. M. xxix. 80.
- *Coccyx subsequana*, Haw. (*Steganoptycha*); E. M. M. xxiv. 6, xxix. 177; Proc. Dors. N. H. & A. F. C. xi. pl. fig. 5.
  - *pygmæana*, Ent. Syn. List (non Hb.).
- *Coccyx pygmæana*, Hb.
  - *Steganoptycha pygmæana*, Hb.; E. M. M. xxiv. 6.
- *Retinia retiferana*, Hein.; E. M. M. xxix. 113.
  - *margarotana*, H.-S.; Entom. xxiii. 119; E. M. M. xxvi. 49.
- *Retinia posticana*, Zett.; E. M. M. xxv. 146.
- *Stigmonota pallifrontana*, Zell.; E. M. M. xxiii. 232.
- *Dichrorampha alpestrana*, H.-S.; E. M. M. xxix. 175.

CONCHYLIDÆ.
- *Eupœcilia erigerana*, Walsingham.
  - *Conchylis erigerana*, Walsingham; E. M. M. xxvii. 3.

TINEIDÆ.
- *Tinea subtilella*, Fuchs; E. M. M. xxvii. 14; Proc. Dors. N. H. & A. F. C. xii. pl. fig. 1.
- *Blabophanes lombardica*, Hering.
  - *heringi*, Rchn.; E. M. M. xxix. 14.
  - *ferruginella*, Hb., var. ?.
- *Micropteryx kaltenbachii*, Sta.; E. M. M. xxvi. 31.
- *Micropteryx caledoniella*, Griffith; E. M. M. xxvii. 300.
- *Micropteryx sangiella*, Wood, E. M. M. xxvii. 100.

GELECHIIDÆ.
- *Depressaria aurantiella*, Tutt; Ent. Rec. iv. 241.
  - *badiella* var. ?.
- *Bryotropha portlandicella.*
  - *Gelechia portlandicella*, Richardson; E. M. M. xxvi. 29; Proc. Dors. N. H. & A. F. C. xi. pl. fig. 6.
- *Bryotropha obscurella*, Hein.; E. M. M. xxvi. 112; Entom. xxiii. 119.
- *Bryotropha tetragonella.*
  - *Gelechia tetragonella*, Sta.; E. M. M. xxii. 99.
- *Bryotropha figulella*, Staud.; E. M. M. xxix. 158.
- *Lita blandulella*, Tutt; E. M. M. xxiv. 105.
- *Lita semidecandrella.*
  - *Gelechia semidecandrella*, Threlfall; E. M. M. xxiii. 233.
- *Lita salicorniæ*, Hering; E. M. M. xxx. 80, 188.
- *Lita ocellatella*, Sta.; Ent. Ann. 1859; E. M. M. xxix. 243.
- *Lita suædella*, Richardson; E. M. M. xxix. 241, xxx. 81.
- *Xystophora* (*Doryphora*) *elongella*, Hein.; E. M. M. xxvi. 112.
- *Xystophora* (*Doryphora*) *quæstionella*, H.-S.; E. M. M. xxiv. 104.
- *Anacampsis anthyllidella*, Hb.; Ent. Syn. List, p. 33.
  - var. *sparsiciliella*, Barr.; E. M. M. xxvii. 7, xxviii. 80.
- *Symmoca signatella*, H.-S.; E. M. M. xxvii. 8.
- *Cataplectica farreni*, Walsm.; E. M. M. xxx. 200.

Cataplectica auromaculata, Walsm.; E. M. M. xxx. 201.
Heydenia auromaculata, Frey.; E. M. M. xxiii. 13.
Butalis laminella, H.-S.; E. M. M. xxv. 15, 16.
Butalis siccella, Zell.; E. M. M. xxiii. 275; Proc. Dors. N. H. & A. F. C. x. pl. fig. 6.

GLYPHIPTERYGIDÆ.

Acrolepia assectella, Zell.; E. M. M. xxv. 291.
Heliozela betulæ.
Tinagma betulæ, Sta.; E. M. M. xxvi. 264; Proc. Dors. N. H. & A. F. C. xii. pl. fig. 1.

ARGYRESTHIIDÆ.

Argyresthia illuminatella, Zell.; E. M. M. xxx. 51.

GRACILARIIDÆ.

Ornix fagivora, Sta.; E. M. M. xxii. 64.
**Ornix fragariæ*, Sta.; Ent. Ann. 1874, p. 161.

COLEOPHORIDÆ.

Coleophora adjunctella, Hodgn.; Ent. Syn. List, p. 37.
paludicola, Sta.; Ent. Mo. Mag. xxii. p. 9.
Coleophora agrammella, Wood; E. M. M. xxviii. 283.
Coleophora alticolella, Zell.; E. M. M. xxviii. 118.
Coleophora flavaginella, Zell.; ("Lienig"), E. M. M. xxiv. 13, 14.
Coleophora glaucicolella, Wood; E. M. M. xxviii. 118.
Coleophora leucapennella, Hb.; E. M. M. xxvii. 302.
Coleophora limoniella, Sta.; E. M. M. xxi. 60.
Coleophora mæniacella, Sta.; E. M. M. xxiv. 42.
mühligiella, Sta. (nec Wk., Hein.); E. M. M. xxiv. 14.
flavaginella, Mühlig MS.
**Coleophora obtusella*, Sta.; Ent. Ann. 1874, p. 162.
Coleophora potentillæ, Sta.; (Boyd MS.), E. M. M. xxiv. 231.
Coleophora sylvaticella, Wood; E. M. M. xxviii. 118.
Coleophora bilineatella, Zell.
tinctoriella, Cov.; Entom. xviii. 225.

ELACHISTIDÆ.

Cosmopteryx schmidiella, Frey.; E. M. M. xxiii. 111.
**Chauliodus daucellus*, Peyerimhoff; Ent. Ann. 1873, p. 43; E.M.M. xxiv. 143.
Elachista scirpi, Sta.; E. M. M. xxiii. 254.

LITHOCOLLETIDÆ.

Lithocolletis anderidæ, Fletcher; E. M. M. xxii. 40.
Lithocolletis betulæ, Zell.; E. M. M. xxvi. 156.
Lithocolletis cerasicolella, H.-S.; E. M. M. xxix. 82.
Lithocolletis distentella, Frey.; E. M. M. xxii. 261.
Lithocolletis sorbi, Frey; E. M. M. xxii. 262.

NEPTICULIDÆ.

Nepticula assimilella, Zell.; E. M. M. xxii. 113.
Nepticula auromarginella, Richardson; E. M. M. xxvi. 30.
Nepticula desperatella, Frey.; E. M. M. xxiii. 188.

* The species marked with an asterisk are not really additions, but are included here as they were accidentally omitted from the "Entomologist Synonymic List," published in 1884.

? *Nepticula filipendulæ*, Wk.; Trans. Chich. & W. Sussex N. H. Soc. No. 5 (1886).
Nepticula fulgens, Sta.; E. M. M. xxv. 12.
Nepticula gei, Wk.
  gei, Staud.; Lep. Dorset, ed. 2, p. 73 (1891).
  aurella var. ?
Nepticula hodgkinsoni, Sta.; E. M. M. xxi. 103; Entom. xvii. 281.
Nepticula nylandriella, Tengst.; E. M. M. xxii. 65.
Nepticula pyri, Glitz.; E. M. M. xxvi. 88.
Nepticula rubivora, Wk.; E. M. M. xx. 188.
Nepticula serella, Sta.; E. M. M. xxiv. 260.
Nepticula torminalis, Wood; E. M. M. xxvi. 209.
Nepticula woolhopiella, Sta.; E. M. M. xxiv. 62.

MALE *CYCLOPIDES MINENI.*

By Philip de la Garde, F.E.S.

A male example of this species was caught by me at Mombasa in July of this year, and has been kindly identified by Mr. Trimen, Curator of the South African Museum, who gives the following description:—A male of *Cyclopides mineni*, Trim., taken at Mombasa in July, 1894, by Mr. P. de la Garde, R.N., expands 11 lin., while the type specimen (apparently a female) taken in Manica by Mr. F. C. Selous expands 1 in. 2½ lin. The Mombasa specimen further differs from the type in having on both upper and under sides of the fore wing a ninth (costal) spot in the discal series, while the lower of the two disco-cellular spots, though present on the under side, is wanting on the upper side; and on the under side of the hind wing both the sub-basal spot and the disco-cellular spot are conspicuously centred with white.

I much regret I am unable to state what shrub this insect was caught amongst, owing to absolute ignorance at the time of its being a new species, and I therefore took no special note of surroundings.

Mr. Trimen tells me that the original description and figure of Mr. Selous' example appeared in Proc. Zool. Soc. 1894, p. 72, Pl. vi. f. 16.

H.M.S. 'Raleigh,' Simons' Bay, Sept. 27th, 1894.

NOTES AND OBSERVATIONS.

Mr. John W. Downing's Collection.—This collection of British Macro-Lepidoptera was dispersed at Stevens's on October 23rd. On the whole the condition of the specimens was, perhaps, not quite so good as usual. Mr. Downing, however, was well known as a pretty constant frequenter of Stevens's sale-rooms, and his collection contained numerous excerpts from many of the principal sales held there for several years past. Two lots of five and six specimens each of *Aporia cratægi* (which is rapidly advancing in price), with others, fetched 26/– and 80/–. Pairs of *Pieris daplidice*, with *Leucophasia sinapis*, &c., went for 80/–, and 21/–. Fifteen *Chrysophanus dispar* ranged from 90/– for a fine female to 45/– for an indifferent male. They were, however, all more or less damaged or repaired, and decidedly, as far as condition was concerned, were below the average specimens of this scarce species recently disposed of, which no doubt accounts for the moderate price obtained. A very fine black male *Lycæna adonis* went to a well-known collector of this group for 70/–; whilst three and four specimens of *L. acis*, with other decent things, were not dear at 21/– a lot. *Dicranura bicuspis*, mostly from Dr. Gill's collection, went chiefly to Devonshire, at an average of about 9/– a specimen. Mr. Bidwell's Ipswich *Notodonta trilophus* fetched 26/–. There were some fine examples of the old fen form of *Ocneria dispar* from Dr. Gill's collection, which realised 10/–, 8/–, and 8/– a lot. Twenty *Lælia cænosa*, sold in pairs, fetched from 32/6 to 20/– for two females, with pupa-case. Two lots of half-a-dozen each of *Lithosia molybdeola* and *L. caniola* brought 30/– and 28/–; *caniola* alone fetching 26/– and 18/–. Six *Nola centonalis* and eleven *N. albulalis* fetched 26/–. A fine specimen of *Deiopeia pulchella*—indeed one of the finest I have seen, taken by W. J. Austen at Folkestone—was cheap at 26/–. Two others, not authenticated, with other things, only realised 12/–. A pair of *Lasiocampa ilicifolia*, with no history other than "Cannock Chase," went for 30/–. A specimen of *Leucania vitellina*, taken by Mr. Downing himself, made 18/–. Two others, one by Meek, 16/–; remaining two, no data, with nineteen other Leucanidæ, went for 7/–. A fine lot of eight *Senta ulvæ*, including one very nice var. *wismariensis*, for which there was sharp competition, was captured for 42/–. Four lots of five *Nonagria brevilinea*, with *cannæ*, *neurica*, and other good things, fetched from 7/– to 14/– a lot; one of the lots, at 11/–, included two of the var. *sinelinea* (Farn). Specimens of *Laphygma exigua*, one from Sheppard's collection, fetched 8/– and 12/–; whilst two *Pachetra leucophæa*, from Wye Down, with others, only cost their purchaser 8/–. Of *Noctua subrosea* there were four pairs and a triplet, which made from 63/– a pair to 26/– for the three. Some fine vars. of *Tæniocampa gothica*, including var. *gothicina*, with seven *Pachnobia alpina*, went for 13/–. A fine black *Dianthœcia conspersa* var. *obliteræ* of Robson (doubtless from Unst), with ten *D. cæsia* and four good *D. barrettii*, went for 26/–; other similar lots of *D. barrettii* realising from 26/– to 20/–. The gem of the collection was a remarkable mottled variety of *Venilia maculata*, in which the ground colour and the colouring of the spots apparently changed places; this made 80/–. With this exception, I noticed nothing very special amongst the Geometræ.—Thos. W. Hall.

VANESSA C-ALBUM IN KENT.—I have five specimens of this insect, which were said to have been taken by the late Alexander Russell, of this town, about thirty-six years ago, in East Kent. Russell himself did not tell me where he had taken them; he was reticent about the matter. A single specimen was taken at Godinton, near Ashford, by Mr. W. Young about fifteen years ago. There may be a locality for the species in Kent, and the seemingly sporadic appearance of the insect may be caused by stragglers from its metropolis. The last years of the fifties were years of plenty for butterfly-hunters; many of the Diurni that I have not seen of late years were then common objects of the country in this district, and young collectors, thinking it would be always so, neglected to fill up their series, to their lasting regret.—C. VIGGERS; 36, Hardinge Road, Ashford, Kent, Nov. 15th.

LIPARIS SALICIS IN THE LONDON DISTRICT.—Mr. Barrett, in his 'Lepidoptera of the British Islands,' writes concerning *Liparis salicis*:—"Now it appears never to be seen around London." . . . . It may therefore be interesting to note that I found one of these moths at Shepherd's Bush in 1887, and in 1892 I found a larva on a poplar-tree growing in our garden.—J. F. BIRD; Rosedale, 162, Dalling Road, Hammersmith, W., Nov. 5th, 1894.

LARVÆ ON MONKSHOOD.—With respect to recent notes (*ante*, pp. 268, 294, 318), it may be of slight interest to mention that during 1892 and 1893 I bred some twenty specimens of *Polia flavicincta*, from larvæ found feeding on *Aconitum* in my garden.—A. VINCENT MITCHELL; Crozier Road, Mutley, Plymouth, Oct. 25th, 1894.

A SUGGESTION IN ANTICIPATION OF NEXT YEAR'S SUGARING.—As the berries of the yew (and perhaps of the ivy) are so very attractive to autumnal species of Lepidoptera, why should they not, if gathered now and bottled in rum for next season, be mixed with sugaring compound and prove equally seductive in summer and early autumn?—H. G. KNAGGS; Folkestone.

"KYANIZING" AND THE "EMERALDS."—I do not think that it is generally known, at least it was unknown to me until quite recently, that a weak solution of perchloride of mercury is destructive to the greens of such genera as *Geometra*, *Phorodesma*, *Nemoria*, and *Iodis*; but I was horrified the other day to find that such was the case, the more so as the mischief had been done by my friend Mr. Hills in carrying out my suggestion of spraying with a five-grain ethereal solution of the perchloride. It is some consolation to know that, with the exception of the insects mentioned, no further damage was done, and the result of the operation was otherwise perfectly satisfactory. Still most of your readers will agree with me, I fancy, that the above warning is very necessary.—H. G. KNAGGS; Folkestone, Oct., 1894.

ENNOMOS TILIARIA, SECOND BROOD? — Although I am afraid it will not afford an explanation of the appearance of the second brood of *Ennomos tiliaria* which Mr. Bruce recorded in the November number, yet it may be of interest to note that I beat from a birch in the New Forest, on Aug. 6th this year, a larva of this species, which I thought was nearly full-grown. The next day I returned to London, and I then sleeved it on a young birch-tree in the garden, expecting it to spin up at once; this it did on the 15th, making a flimsy cocoon of pale yellow silk between a birch-leaf and the material of the sleeve, having apparently fed fairly regularly on the preceding nights. The cocoon was quite slight, and the larva, which could be easily seen through it, did not pupate for five or six days, and eventually emerged on Sept. 20th. Whether *E. tiliaria* was particularly common in the New Forest this year, or whether there were two successive emergences like those noted by Mr. Bruce in Sussex, I do not know; but if so, the fact of the larva being found on Aug. 6th in a nearly full-grown condition would make it very improbable that the second brood had descended from the first. —F. P. BEDFORD; 326, Camden Road, N.W.

CAPTURES AND FIELD REPORTS.

PETASIA CASSINEA IN OXFORD.—On Nov. 6th I was brought by my friend Mr. F. J. Briggs a much-worn male specimen of *Petasia cassinea*, which he found on a lamp in Oxford the evening before. The wings, though considerably rubbed, are not a bit torn, and some of the markings are still very distinct. I believe this species has not been taken before in this district.—H. W. SHEPHEARD-WALWYN; Hertford College, Oxford, November 6th, 1894.

NOTES ON PIERIS BRASSICÆ, &c.—Concerning Mr. W. J. Lucas's query (*ante*, p. 295), I may say that *P. brassicæ* has been, as far as I have observed, remarkably uncommon this year in this district. I have not seen more than eight or ten specimens during the year. The larvæ are usually abundant in my garden, but this year I have not seen one, though I have diligently searched. Of *Colias edusa* I have seen but one example, a male, which I captured last August at Crabtree. *Vanessa cardui* seems much commoner than usual.—A. V. MITCHELL; Crozier Road, Mutley, Plymouth, Oct. 25th, 1894.

SCARCITY OF PIERIS BRASSICÆ AND P. RAPÆ.—Referring to the remarks of Mr. Lucas and Mr. Harcourt Bath (*ante*, pages 295 and 318 respectively), I can say that in Norway, at Arendal, near Christiania, I only saw two *P. rapæ*, and not a single *P. brassicæ*; on touring about through Fevig, Bolkesbaw, and Hitterdal the numbers were much the same.—C. F. COOPER; Rugby, Nov. 3rd, 1894.

CRAMBUS FASCELINELLUS IN N. LANCASHIRE.—I have just seen an example of the *Crambus* which Mr. Arkle, in his "notes" (*ante*, p. 305), says had been identified for him as the rare *C. fascelinellus*, and find that it is not that species, but the more widely distributed, although local, *C. falsellus*. I may mention that a specimen of the last-named species was sent to me a few weeks ago by another correspondent as *C. ericellus*.—R. S.

ACHERONTIA ATROPOS IN CAMBRIDGESHIRE.—A boy out of the village brought me a very large pupa of *A. atropos* on Oct. 18th, found in a potato-field. In August last I stayed for a month at Harlech, Merionethshire, where *Hipparchia semele*, *Argynnis paphia* and *aglaia* were plentiful on the mountains. I also saw a great many dragonflies. — (Miss) M. WILSON; The Vicarage, Guilden Morden, Royston, Cambs., Oct. 31st, 1894.

CHŒROCAMPA CELERIO IN SOUTH HANTS.—I have a good specimen of *Chærocampa celerio*, which was taken here (Porchester) on Sept. 30th. I thought it worth recording, as I believe this insect is rare. — (Miss) M. J. STARES; Porchester, Hants.

CHŒROCAMPA CELERIO IN KENT.—*C. celerio* was taken on the South Foreland Lighthouse on August 12th of this year, by the lighthouse-keeper.—H. S. FREMLIN.

COLIAS EDUSA IN SURREY.—I captured a fine male *C. edusa* in a lane near Ashtead, on August 29th.—W. J. KAYE; Worcester Park, Surrey, Nov. 13th, 1894.

PLUSIA NI BRED FROM PORTLAND.—In July last Mrs. Richardson was so fortunate as to find, at Portland, two larvæ which so much resembled *Plusia gamma* that I suggested that they were only that abundant species, and might as well be turned out into the garden; however, she was wiser, and kept them till they turned to pupæ enclosed in cocoons which were smaller and much neater than those of *P. gamma*. On Sept. 6th a beautiful specimen of *P. ni* emerged, and a second one on Sept. 10th. This is not the first occurrence of this species at Portland, as Colonel Partridge took a specimen there at light in Sept., 1888 (E. M. M. xxv. 160). It looks as if it had established itself in the locality, and I hope that it may turn up again next year. I do not think that any one could easily mistake the imago for *gamma;* it is more like *interrogationis*. — NELSON M. RICHARDSON; Montevideo, near Weymouth, Nov. 9th, 1894.

DRAGONFLIES AT THE BLACK POND, ESHER.—During the latter part of the season of 1894 this neighbourhood yielded some fairly good insects belonging to the exceedingly handsome, though much maligned but no less harmless, group of the *Odonata*. Early in August we discovered the presence there of *Anax formosus* (the imperial dragonfly), and on the 10th three were secured, in addition to those already recorded (*ante*, 271). Extremely difficult is it to get within striking distance of these splendid insects, not only because they seem particularly suspicious of any person in possession of a net, but also from the habit they have of keeping well out over the pond, and hawking round the edges of the reed-beds: moreover, their flight is often intermittent, for the disappearance of the sun behind a cloud is the signal for the cessation of their restless movements to and fro, which are resumed however on his reappearance. The number of insects they destroy must be enormous, but, as with other large dragonflies, they do not take them haphazard, for I have often noticed them approach a large insect (possibly a bee), and when within a foot or so of it retire, as if disappointed. Other dragonflies on the wing on the 10th were *Æschna grandis, Libellula quadrimaculata, L. scotica* [*Sympetrum scoticum*], *Agrion puella*, and *A.* [*Pyrrhosoma*] *tenellum*. While absent from the neighbourhood for a time, at the end of August, the companion of most of my dragonfly expeditions sent me two male specimens of *Æschna juncea*, one male *Æ. cyanea*, and one male *Æ. grandis*, all of which he took at the Pond on Aug. 31st, an ideal dragonfly day. On Sept. 10th we again paid a visit to Esher, and found that *A. formosus* was over, its place being taken by *Æ. juncea* and *Æ. grandis*. Two of the latter were secured, and three of the former—two males and one female—the last taken as it was ovipositing by repeatedly dipping its abdomen, apparently at random, into the water. Still another member of the genus *Æschna* fell to my net, a single male of *Æ. mixta*. This dragonfly, when captured, was eating a ladybird—an insect which is usually considered an unpalatable morsel. *Agrion puella* was still on the wing, and one *A. pulchellum* was secured. With *Libellula scotica* was now flying a congener, *L. striolata* [*Sympetrum vulgatum*], a single specimen of which I had, I believe, sighted as early as Aug. 10th. Sept. 12th afforded no fresh species, but we noticed that, at this part of the season at least, the larger dragonflies seemed to fly best during the four or five hours at the middle of the day and then, as a rule, only when the sun was shining. As exceptions to rule, however, I ought to mention that I saw an *Æ. grandis* flying in Oxford at 7 p.m. on August 29th, and another *Æschna* (probably *cyanea*), circling about, at Morden, in Surrey, on the very dull afternoon of Sept. 16th. Our last expedition of the season took place on Sept. 19th, on a still and warm, but autumnal afternoon. On this occasion *L. scotica* and *L. striolata* were well in evidence, and a few *A. puella* were still about; but our attention was chiefly taken up with *Æ. juncea* and *Æ. grandis*, which were even yet on the wing in fair numbers. Both species had a propensity for settling in the sun, on the trunks of the pines which fringe the margin of the Pond, and while so resting were very difficult to see. Attempts to reach them from the front were not successful, but if the tree was approached from behind a stroke might be made without frightening the insects, even with the net held in the hand, the stick being dispensed with for the occasion. From this and other observations, it is clear that the sight of a dragonfly is very keen, while the incident just mentioned would seem to point to the fact that the sense of hearing is not well developed in these insects. On this day an *Æschna* (no doubt *juncea*) was noticed with a very large object in its jaws. Presently something was allowed to fall, which proved to be the larger part of a silver-y moth (*Plusia gamma*), from which the dragonfly had bitten the head and front part of the thorax, allowing the rest to fall to the ground. Our captures at this single pond during 1894 and the preceding season have comprised fifteen species, viz.:—*Platetrum depressum*, *Libellula quadrimaculata*, *L. striolata* [*Sympetrum vulgatum*], *L. scotica* [*S. scoticum*], *Cordulia ænea*, *Anax formosus*, *Æschna mixta*, *Æ. juncea*, *Æ. cyanea*, *Æ. grandis*, *Agrion* [*Enallagma*] *cyathigerum*, *A. pulchellum*, *A. puella*, *A.* [*Pyrrhosoma*] *minium*, *A.* [*P.*] *tenellum*; while *Calopteryx splendens* and *Brachytron pratense* I secured in the same neighbourhood, though not at the Black Pond.—W. J. Lucas; Gordon Road, Kingston-on-Thames, Nov. 12th, 1894.

Tortrices at Northwood, Middlesex. — In my note under this heading (*ante*, p. 323) the names of two species were unfortunately transposed. I refer to *Phoxopteryx lactana* and *Grapholitha ramella*. The two forms mentioned are those of the last-named species, one of which resembles *P. lactana* (=*ramella* of the 'Manual'), and the other is very similar to *Pædisca bilunana*. "*G.*" *germarana* should be *Stigmonota germarana*. I may add that *S. internana* was generally common wherever furze (*Ulex europæus*) was plentiful, and two examples of *Penthina capræana* were bred from larvæ in sallow-shoots.—R. S.

Collecting at Tunbridge Wells.—The season of 1894 has been, in my opinion, a very bad one. Early in March I worked the sallows on the railway banks here, and took a few *Tæniocampa stabilis*, *T. instabilis*, *T. gothica*, *T. cruda*, *Pachnobia rubricosa*, and *Xylocampa lithoriza*. By April 3rd the sallow bloom was over. At lamps in the spring and autumn *Phigalia pilosaria*, *Asphalia flavicornis*, *Hybernia rupicapraria*, *H. progemmaria*, *Aniosopteryx æscularia*, *Eugonia erosaria*, *Lophopteryx camelina*, *Cymatophora fluctuosa*, *Crocallis elinguaria*, *Cidaria miata*, *Orthosia lota*, *Selenia illustraria*, *Xanthia flavago* (*silago*), *X. fulvago* (*cerago*), *Gortyna ochracea* (*flavago*); *Ennomos tiliaria* was particularly plentiful on lamps this season. I can strongly recommend Messrs. Watkins and Doncaster's improved lamp-net, as it saves all climbing, and an insect is rarely missed. On Ashdown Forest and at Tunbridge Wells sugar was of little use, but *Phlogophora meticulosa* and *Amphipyra pyramidea* were particularly plentiful. I took one more *Plusia moneta*, making my seventh capture of this beautiful insect. Rhopalocera were scarce this summer, but I took some beautiful specimens of *Argynnis aglaia* and *A. adippe*, in the Broadstone Warren, Ashdown Forest. *Pieris brassicæ* was very scarce, as also was *Vanessa io*.—R. A. DALLAS BEECHING; Tunbridge Wells, Nov., 1894.

COLLECTING IN SOUTH WALES.—The following notes of the season which is fast closing may be worthy of note from this part of South Wales. Speaking generally, it has been, with a few exceptions, unfavourable and disappointing with Lepidoptera. The season early appeared to promise well; *Hybernia rupicapraria*, *H. marginaria* (*progemmaria*), and *Anticlea badiata* (the last-named particularly) were common; and species of *Tæniocampa* were fairly so. I noticed *Lycæna argiolus* on April 3rd, *Argynnis euphrosyne* on the 17th, and also *Euchloë cardamines;* all three species were fairly abundant. But in the month of May the weather changed, the temperature being very cool, and on three nights sharp frosts occurred, which appeared to have caused the disappearance of *E. cardamines* before the end of the month. Of this butterfly I captured a very diminutive specimen, measuring only 1 inch 3½ lines, taking twelve lines to an inch. All the *Pieris* were scarce throughout the spring, and were not plentiful in the second brood also; of *P. brassicæ* I did not observe more than a dozen specimens. The following were the only Lepidoptera in any way abundant:—*Lycæna icarus*, *Argynnis euphrosyne*, *A. aglaia*, *Vanessa urticæ*, *Pararge megæra*, *Grammesia trilinea*, *Agrotis exclamationis*, *A. tritici*, *Caradrina cubicularis*, *Plusia gamma* (this moth particularly so in September and early October), *Phlogophora meticulosa*, *Rumia cratægata*, *Cidaria fulvata*, *C. suffumata*, *C. ribesiaria*, *Acidalia aversata*, *A. bisetata* (this last particularly so). Of usually common species which were scarce, *Spilosoma menthastri*, *S. lubricipeda*, *Triphæna pronuba*, *T. comes* (*orbona*), *T. ianthina*, *Apamea didyma* (*oculea*), and *Noctua xanthographa* were the most noticeable. "Sugar" proved, on the whole, a complete failure, the only species appearing rather commonly being *Grammesia trilinea*, *Agrotis exclamationis*, and *P. meticulosa*. A few days in July was the only time some of the Noctuæ appeared even in existence, and the blossoms of flowers and other bloom proved the only attraction; all bloom, commencing with the "May," has been most luxuriant this season here, and when this is the case I have not much faith in artificial sweets. *Vanessa cardui* I noticed rather more frequently than for some seasons, but it was not a "*cardui*" year. Of *Colias edusa* no examples were seen. The apple-trees when in blossom were much infested with small larvæ, and that now much-abused bird, the house-sparrow, was very busy destroying them.

Up to the present time, autumn moths excepting, *Xanthia ferruginea* and *P. meticulosa* are very scarce, but the very rainy weather we have had since Oct. 22nd may have kept them from showing themselves. Geometræ larvæ, however, I have frequently noticed. Queen wasps were abundant in the spring, but very few of their progeny have since appeared.—T. B. JEFFERYS; Langharne, Carmarthenshire, November, 1894.

COLLECTING AT DOUGLAS, LANARK.—During July and part of August insects were rather unusually abundant here, and sugaring successful. This year, too, has been remarkable, as bringing to light insects which I have not seen in this locality before; whilst, on the contrary, some which I have taken each year previously were absent this. I began sugaring on July 20th. This was the most successful night I had as regards numbers, and was memorable for an exceedingly fine display of aurora soon after midnight. *Xylophasia polyodon* turned up in large numbers, amongst them being many beautiful, rich, dark varieties. *Noctua festiva* was also in abundance and very variable, and *Mamestra anceps* was fairly common. Besides these a few or single specimens of the following were taken:—*Xylophasia rurea, Noctua plecta, Leucania impura, Chortodes arcuosa* (not taken by me here before), *Larentia cæsiata* (not observed at sugar previously by me), *Miana fasciuncula, Noctua augur.* Single specimens of *Ellopia fasciaria* and *Coremia propugnata* were taken on the wing at dusk, and specimens of *Melanippe rivata* and *Metrocampa margaritaria* (unusually common this year) at rest on tree-trunks. *Larentia pectinitaria* was also unusually abundant on the moors, owing perhaps to the large amount of bedstraw this year. A specimen of *Tanagra atrata* (*chærophyllata*) was brought to me the same day, and on the 24th I took another; I have never observed the species here before. July 24th, very windy night. At dusk a good many *Larentia cæsiata* (usually scarce here) were netted; also *Larentia pectinitaria, Melanippe rivata, Metrocampa margaritaria, Agrotis porphyrea*, and a single specimen of *Hepialus velleda* (not observed here before) flying over the heather. Several *Cœnonympha pamphilus* were observed at rest on rushes on the moor after dark. Sugar produced all the species previously taken, as well as *Agrotis porphyrea, Triphæna pronuba* (dark varieties), and *Noctua xanthographa* (dark varieties). July 27th seemed an ideal night; but not many insects turned up, some sugared trees being blank. At dusk *Cidaria pyraliata, Hypsipetes elutata*, and *Mamestra brassicæ*, besides those taken before, were netted. At sugar occurred the species previously noted, and *Coremia propugnata* (1), *Leucania impura, Mania typica, Apamea oculea, Caradrina alsines*, and *Ellopia fasciaria;* whilst *Heliothis marginata* and *Charæas graminis* flew into the candle-light. Flying over the heather at dusk, I took a pretty *Eupithecia*, which I have not yet identified; I had taken one other of the same species under like circumstances on the 24th. July 29th. A specimen of *Lycæna alexis* seen. July 31st. *Noctua baia.* Aug. 3rd. Most of the old things still about; at sugar a single specimen of *Celæna haworthii* put in an appearance for the first time this year. Aug. 6th. *Eubolia mensuraria* beginning to occur. Aug. 10th. A cold night; few insects about. *Cidaria populata* beginning to emerge. At sugar, *Cidaria pyraliata* (1), *Celæna haworthii* (1); the latter, generally fairly abundant, has been almost absent this year, though I have searched for it on the rushes after dark, where it is usually to be found. A single specimen of *Noctua neglecta* visited the sugar to-night; I have never seen it here before. Why should it be fairly common this year? Aug. 17th.

Not a favourable night; rather cold and windy, with nearly full moon. In spite of this I took nine *Noctua neglecta* at sugar, and noticed that almost all seemed to prefer the drops of sugar on the ground at the foot of the trees. I took another pair of *neglecta* in cop. on the heather. *Noctua glareosa* (7) also put in an appearance at sugar for the first time this year, and I also took one at the flowers of a rush. Aug. 20th. Sugared extensively over the heather to get *neglecta*, but night unfavourable, bright moon, and slight frost, and only got two specimens. Nothing else occurred at the sugar, except one *Noctua xanthographa* and two or three worn *Xylophasia polyodon*. Aug. 23rd. Again tried especially for *neglecta*, but only took one. Hardly anything at sugar. It got cold after dark, and there were four degrees of frost during the night. Aug. 25th. Saw a specimen of *Polyommatus phlœas* and several *Pieris rapæ*; butterflies of any kind are a rarity here. Aug. 28th. *Polia chi*, always common here, is beginning to emerge. Aug. 29th. Took one *Crocallis elinguaria*. Aug. 31st seemed an ideal night for sugar, but only two moths (*Noctua glareosa* and *Xylophasia polyodon*) put in an appearance. The lime-trees had just come out, which may have keep insects away from the artificial sweets. *Tapinostola fulva*, out now in plenty, flying over the damp places on the moors at dusk; *Cidaria miata*, one specimen on Sept. 20th. *Oporabia dilutata* beginning to emerge on 21st. *Carsia imbutata*, which has been observed each year lately at Douglas, sometimes commonly, was this year apparently entirely absent; at least I saw not a single specimen.—(Rev.) J. A. MACKONOCHIE; The Hirsel, Coldstream, N.B., Oct. 24th, 1894.

COLLECTING IN KINCARDINESHIRE.—I spent a fortnight collecting, in July of this year, at Stonehaven, a seaport, and the county town of Kincardineshire. It is a favourite summer resort, being situated in a beautiful bay. One of the principal objects of interest is Dunotter Castle, about a mile from the town, which stands on a perpendicular rock 150 ft. above the level of the sea, and almost separated from the land by a deep chasm. The coast is bordered with cliffs, intersected with beautiful little bays; and in these bays I spent most of my time collecting, the castle bay perhaps receiving most attention. Here *Lycæna agestis* var. *artaxerxes* seemed to have its headquarters, although it occurred in most of the other bays. I took a long series, and obtained a couple with large white discoidal spots on the posterior wing. *L. alexis* was also very common, and the females varied considerably. One which I have taken is almost as blue as the male, with the spot on the anterior wing surrounded with white, and three of the cellules at the tip of the wing have dashes of white. Two others are almost as dark as *artaxerxes*, with a very slight suffusion of blue on them. *Pieris brassicæ*, *rapæ*, and *napi* were all represented; the last mentioned seemed to vary somewhat, but unfortunately they were not in good condition. *Vanessa urticæ* was often observed careering along wildly. I netted several specimens of *V. cardui*, but they were mere shadows of their former beauty. A single specimen of *V. atalanta* on one occasion alighted on a flower; my net was in my bag, but I quickly fixed it up, and, just as I made the stroke, it circled aloft, bidding me farewell by disappearing over the cliff. *Hipparchia semele* was just beginning to make its appearance, and I managed to obtain two or three examples. *Epinephele ianira* was abundant everywhere; the females were very large and beautifully marked. *Cœnonympha pamphilus* was common above the cliffs at Fowls Heugh. Two examples of *Polyommatus phlœas* were obtained in the castle bay, and several specimens of *L. alsus*. *Hepialus lupulinus* was taken near Cowie. *H. velleda* was very abundant in the castle bay, and several of the var. *carnus* were netted; *H. humuli* was also very common. and much larger than those we obtain near Glasgow. *Zygæna filipendulæ* was also common, especially at Fowls Heugh, where it might be seen on the top of the cliffs flying in dozens; the ground colour is much bluer than some southern specimens I have in my collection; I obtained one specimen with the spots and the under wing verging on pink. A single type of *Nudaria mundana* was taken from a wall in the town, and, although I watched all the walls along the roads, I could not find its headquarters. A couple of *Gnophos obscurata* were netted in the castle bay on different occasions. A single *Acidalia incanaria* was taken one evening when beating the hedges. Two specimens of *A. scutulata* were taken near the Distillery, and *A. aversata* turned up at times. Single specimens of *Fidonia piniaria* and *Larentia cæsiata* were caught one evening in a fir-wood. *L. didymata* was abundant everywhere. *Metrocampa margaritata* and *L. pectinitaria* occurred in all the woods. *Emmelesia alchemilata* and *albulata* were taken at several places. *Eupithecia vulgata* and *assimilata* were taken in the garden, and two fine specimens of *subfulvata* were caught in one of the bays. A couple of *Thera variata* were netted on different occasions. *Melanthia ocellata*, *Melanippe subtristata*, *montanata*, and *fluctuata* all occurred in numbers. *Coremia munitata* was taken where the ground was marshy, and three females came to sugar one evening. *Camptogramma bilineata* was also common, and varied considerably. *Cidaria russata*, *immanata*, *fulvata*, and *pyraliata* occurred in some numbers, a fine variety with a dark central band being taken of the last. *Abraxas grossulariata* and *Halia vauaria* were taken in the gardens, and *Eubolia mensuraria* was common everywhere. Sugaring took fairly well some evenings. *Leucania conigera* put in its appearance frequently; *lithargyria*, *impura*, and *pallens* in abundance; as also *Xylophasia rurea* and a few of the var. *alopecurus*, *lithoxylea*, and *polyodon* with the black var. of the same; *Miana fasciuncula* and its red variety; *Apamea oculea*, commonly; a single and fine specimen of *Caradrina blanda; cubicularis*, in dozens; and several of *Apamea gemina*. Of the *Agrotis*, *exclamationis* was common, and a single and dark specimen of *segetum* was taken. *Triphæna pronuba* came occasionally; but the majority of insects at sugar were of the genus *Noctua*—*augur*, *plecta*, *c-nigrum*, *festiva*, *rubi*, *umbrosa*, and *baia*, all coming freely, a couple of *Phlogophora meticulosa*, several *Hadena oleracea*, and two fine specimens of *Miana typica*. A single specimen of *Bryophila perla* was taken off a wall in the town; *Miana arcuosa* turned up several times; *L. conigera* and *Plusia v-aureum* were netted at the flowers of the ragged-robin; *Habrostola urticæ* at nettles; *P. chrysitis* and *gamma* were taken two or three times, and *Mamestra brassicæ* in the gardens and outhouses. *Hypena probosidalis* occurred everywhere, *purpuralis* and *cespitalis* singly; *forficalis*, *fuscalis*, and *lutealis* were also caught. *Scoparia ambigualis*, *dubitalis*, *cembræ*, and *murana* were common; and a single specimen of *angustea* was boxed from a paling in the town. *Crambus pratellus* and *tristellus* were common, *culmellus* a nuisance, and a nice series of *hortuellus* was taken. Of the Tortrices, *herbosana* occurred everywhere; *hohenwarthiana*, *badiana*, *stramineana*, *scutulana*, *hamana*, *lanceolana*, and *ribeana* could be taken frequently; and *ulmana* and *littorana* were taken singly. Amongst the Tineæ, *liturella*, *assimilella*, *cinerella*, *terrella*, *thrasonella*, *curtisellus*, and *albicostella*, and others were taken; *bertrami* turned up occasionally, *fuscodactylus* was common near Cowie, and a single example of *bipunctidactylus* was taken.—A. Adie Dalglish; 21, Princes Street, Pollokshields, Glasgow.

Collecting in West Ross-shire.—The following is a list of Lepidoptera which I took during a ten days' stay at Strathcarron. I send it because, so far, there do not appear to have been any records of collecting in that part of Scotland. The country is rough moorland and mountainous, and there is next to no cultivation in the Carron Valley. There were the usual birch-woods upon the hillsides, and a sprinkling of ancient pine-trees in some sheltered places up among the hills:—*Pieris brassicæ*, *P. napi*, *Argynnis selene*, *A. aglaia*, *Vanessa urticæ* (seen up to 2700 ft.), *Erebia æthiops* (500 ft.), *Epinephele ianira* (much richer brown than in the South of England, and with a slight vinous tint), *Cœnonympha typhon*, *C. pamphilus*, *Thecla rubi*,* *Lycæna icarus*, *Trochilium crabroniformis* (one taken while buzzing about a sallow bush at the sea-level), *Zygæna* (*trifolii?*) (an empty cocoon), *Bombyx callunæ* (larvæ), *Saturnia carpini* (larvæ), *Nemeophila russula*, *Orgyia antiqua* (empty cocoon and eggs), *Thyatira batis*, *Asphalia flavicornis* (larvæ), *Acronycta rumicis*, *Leucania impura*, *L. pallens*, *Xylophasia rurea* and var. *combusta*, *X. lithoxylea*, *X. monoglypha* (mostly darkish, and some nearly black), *Apamea gemina*, *A. didyma*, *Miana arcuosa*, *Caradrina quadripunctata*, *Agrotis strigula*, *Noctua augur*, *N. plecta*, *N. c-nigrum*, *N. festiva*, *Triphæna comes*, *T. pronuba*, *Mania typica*, *Tæniocampa gothica* (larvæ), *T. gracilis* (larvæ), *Aplecta tincta*, *Hadena adusta*, *Calocampa vetusta* or *C. exoleta* (larva), *Cucullia umbratica*, *Habrostola tripartita*, *Anarta myrtilli*, *Metrocampa margaritaria*, *Ellopia prosapiaria*, *Biston hirtaria* (larvæ), *Boarmia repandata*, *Dasydia obfuscata*, *Psodos coracina*,* *Acidalia bisetata*, *A. fumata*, *Cabera exanthemaria*, *Larentia cæsiata*. *L. flavicinctata*, *L. viridata*, *Emmelesia alchemillata*, *E. albulata*, *E. minorata* (*blandiata*), *Eupithecia pulchellata* (larvæ), *E. minutata ?*, *Hypsipetes sordidata* (the moorland form and very variable and handsome), *Melanthia ocellata*, *Melanippe hastata* (larvæ), *M. sociata*, *M. montanata*, *Camptogramma bilineata* (some nice dusky vars. and brownish vars., rather like the Shetland examples), *Cidaria miata* (larvæ), *C. truncata*, *C. populata*, *Anaitis plagiata*, *Crambus margaritellus*. Species marked with an asterisk were noticed by Mr. L. Hinxman earlier in the year. I have purposely not added any remarks about the numbers of each insect, because I think, after so short an experience, such remarks might be more misleading than instructive.—W. M. Christy; Watergate, Emsworth, Hants, Nov., 1894.

Errata.—*Ante*, p. 301, line 7, for "right" read "left"; p. 321, line 13, for "Toxford" read "Yoxford"; p. 323, for "Canford Hill Estate" read "Canford Cliffs Estate."

SOCIETIES.

Entomological Society of London.—*October* 17*th*, 1894. Henry John Elwes, Esq., F.L.S., F.Z.S., President, in the chair. Dr. H. G. Breyer, of Prætoria, Transvaal, South Africa, was elected a Fellow of the Society. Mr. G. C. Champion read a letter, dated 15th August last, from Mr. J. Y. Johnson, of Funchal, Madeira, on the subject of a recent visitation of locusts to the Island, and exhibited specimens.

Mr. Johnson mentioned that Darwin, in his 'Origin of Species,' recorded that in November, 1844, dense swarms of locusts visited Madeira. He said that since then, until August last, these insects had not visited the Island. Mr. Champion remarked that the species sent by Mr. Johnson was *Decticus albifrons*, Fabr., not a true migratory locust. Mr. Champion also exhibited specimens of *Anthaxia nitidula*, *Velleius dilatatus* and *Athous rhombeus*, taken by himself in the New Forest during the past summer. Mr. H. Goss read a letter he had received from Capt. Montgomery, J.P., of Mid-Ilovo, Natal, reporting vast flights of locusts there, extending over three miles in length, on the 31st August last, and exhibited a specimen of the locust, a species of *Acridium*. Capt. Montgomery stated that, as a rule, his district and most of Natal was free from the pest, but that an exceptional invasion had occurred in 1850. Mr. J. W. Tutt exhibited four typical specimens of *Emydia cribrum* from the New Forest, and, for comparison, four specimens of the var. *candida* of the same species, taken at an elevation of 4000 ft. near Courmayeur, on the Italian side of Mont Blanc. He stated that he had also met with this form in the Cogne Valley, at an elevation of from 6000 to 8000 ft. Mr. R. Adkin exhibited, for Mr. H. Murray, a specimen of *Erebia æthiops*, in which the left fore wing was much bleached, taken in August last, near Carnforth. Mr. Adkin also exhibited a series of *Acronycta rumicis* from Co. Cork, Ireland, including light and black forms, with examples from the Scilly Isles, Isle of Man, and North of Scotland, for comparison. Mr. Elwes exhibited a series of *Chionobas alberta* (male and female), *C. uhleri* var. *varuna*, and *Erebia discoidalis*, from Calgary, Alberta, N.W. Canada, collected in May last by Mr. Woolley-Dod. He said that the validity of *C. alberta*, which had been questioned by Mr. W. H. Edwards, was fully established by these specimens. Prof. Poulton gave an account of the changes he had recently made at Oxford in the arrangement of the Hope Collections in the Department of Zoology, and as to the rooms now available for students working at these collections. Mr. G. T. Bethune-Baker communicated a paper entitled "Descriptions of the Pyralidæ, Crambidæ, and Phycidæ collected by the late T. Vernon Wollaston in Madeira."

November 7th.—Colonel Charles Swinhoe, M.A., F.L.S., Vice-President, in the chair. Mr. W. P. Blackburne-Maze, of Shaw House, Newbury, Berkshire, and Mr. Bertram George Rye, of 212, Upper Richmond Road, Putney, S.W., were elected Fellows of the Society. Colonel Swinhoe exhibited a female of *Papilio telearchus*, Hewitson, which he had received by the last mail from Cherra Punji. He said that this was the only known specimen of the female of this species, with the exception of one in Mr. L. de Nicéville's collection, which he had described in the 'Journal of the Bombay Natural History Society' in 1893. He also exhibited a male of the same species for comparison. Mr. C. G. Barrett exhibited abnormal forms of *Pararge megæra*, *P. ægeria*, *Melitæa athalia*, *Chrysophanus phlœas*, *Charæas graminis*, *Lophopteryx camelina*, *Plusia gamma*, *Cucullia chamomillæ*, *Boarmia repandata* var. *conversaria*, *Cidaria psittacata*, and other species, all collected by Major J. N. Still, on Dartmoor, Devon. He 'so exhibited, for Mr. Sydney Webb, of Dover, a long series of most arkable varieties of *Arctia caja* and *A. villica*. Mr. Gervase F.

Mathew exhibited seven beautiful and striking varieties of *Arctia villica*, bred from larvæ obtained on the Essex coast, near Dovercourt, in March and April, 1893 and 1894. Herr Jacoby exhibited two specimens of *Blaps mucronatus*, with soft elytra, taken on a wall at Hampstead. The Rev. Canon Fowler and Mr. G. C. Champion made some remarks on the subject of the elytra of immature beetles. Mr. H. Goss exhibited a specimen of *Periplaneta australasiæ*, received from Mr. C. E. Morris, of Preston, near Brighton. Mr. McLachlan said the species had been introduced into this country, but was now considered a British insect. Mr. B. G. Rye exhibited specimens of the following rare or local species of Coleoptera, and gave the names of the localities in which they had been taken:—*Cicindela germanica*, *Eumicrus rufus*, *Triarthron markeli*, *Mezium affine*, *Homaloplia ruricola*, *Anomala frischi* var. *julii*, *Synaptus filiformis*, *Lixus paraplecticus*, *Balaninus cerasorum*, *Asemum striatum*, and *Zeugophora flavicollis*. Mr. McLachlan exhibited, for Mr. G. C. Bignell, of Plymouth, two new species of Ichneumonidæ, from Devonshire, viz., *Pimpla bridgmani*, Bign., a parasite on a spider, *Drassus lapidicolens*, Walck.; and *Praon absinthii*, Bign., a parasite on *Siphonophora absinthii*, Linné. Mr. C. O. Waterhouse stated that the *Acridium* received from Capt. Montgomery, and exhibited by Mr. Goss at the last meeting, was *Acridium septemfasciatum*, and he exhibited the species with the wings extended. Mr. Ridley exhibited a species of a scale insect (? *Lecanium*), found on a nutmeg tree in Malacca, and made some remarks on *Formica smaragdina*, which makes its nest on the trees, joining the leaves together by a thin thread of silk at the ends. The first step in making the nest is for several ants to bend the leaves together and hold on with their hind legs, and one of their number after some time runs up with a larva, and, irritating it with its antennæ, makes it produce a thread, with which the leaves are joined; when one larva is exhausted a second is fetched, and the process is repeated. Mr. Waterhouse read a paper entitled "Some Remarks on the Antennæ of Insects." A discussion followed, in which Messrs. Champion, Jacoby, McLachlan, and Gahan took part.—H. Goss and W. W. Fowler, *Hon. Secretaries*.

South London Entomological and Natural History Society.—*October* 25*th*, 1894.—E. Step, Esq., President, in the chair. Mr. Hy. Lamb, of Maidstone, and Mr. Arth. Cosway, of Watford, were elected members. Mr. Jobson exhibited a var. of *Abraxas grossulariata*, L., from his garden, having only a few black scales in place of the usual markings. Mr. McArthur, bred series of *Hypsipetes sordidata*, Fb., from N. Devon; the lighter specimens from bilberry-fed larvæ, and the darker ones from sallow-fed larvæ. Mr. Frohawk, xanthic examples of *Epinephele hyperanthes*, L., and *E. ianira*, L. A long discussion ensued as to the causes of this class of variation, and the effect upon the imago of injuries to the larva and pupa, with the bearing of Weismann's theory thereon. Mr. Tutt, perfectly white vars. of *Emydia cribrum*, L., from the Alps, with New Forest examples for comparison; also two specimens of the new British species *Cataplectica farreni*, Wals., from Cambs. Mr. Mansbridge, the dry carcase of a mole taken from a barn door, which was covered with lepidopterous cocoons and pupa-cases. Mr. H. Moore, two specimens of the violet carpenter-bee, *Xylocopa violacea*, from Podensac, Gironde. Mr. R. Adkin, bred series of *Asphalia ridens*, Fb., from the New Forest; and specimens of *Lycæna ægon*, Schiff., from Oxshot, having the two costal spots on the under side of the lower wing united. Mr. T. W. Hall, a species of Julicidæ found at Stevens' sale-rooms. Mr. Tutt read a paper, entitled "*Zygæna carniolica*, Scop., and its varieties," in which he gave a graphic description of the scenery at the foot of Mt. Blanc, and the delight afforded to an entomologist by the beauty and abundance of the Lepidoptera to be obtained there.

November 8th.—The President in the chair. Mr. R. South exhibited a short series of species of Lepidoptera, representing his captures during the time he had been at Macclesfield, and stated that it was the most barren year he had ever experienced. Mr. Frohawk, bred specimens of *Vanessa atalanta*, L., with an incipient white blotch in the red band on the primaries, and a pale *Thecla rubi*, L. Mr. H. Moore, a series of *Chrysophanus phlœas*. Mr. Edwards, specimens of many good species—*Plusia moneta*, Fab., *Phibalapteryx lapidata*, Hb., *Noctua depuncta*, L., *Acidalia immorata*, L., *Dasycampa rubiginea*, Fb., being among them. Mr. R. Adkin, bred series of *Dicranura bifida*, Hb., from Bucks, and of *D. furcula*, L., from Hants, and in remarking upon the similarity of the two species pointed out their distinguishing features. Mr. Fremlin, nice varied series of *Emydia cribrum*, L., from the New Forest, and a series of *Dasycampa rubiginea*, Fb., from Berks. Mr. C. A. Briggs, very fine varieties of *Lycæna bellargus*, Rott., from Kent; among them were (1) an under side with the black spots much elongated, (2) an under side with most of the black spots absent, and (3) an under side with a considerable increase in size of all the white and lighter markings. Mr. Fenn, a Shetland form of *Cidaria immanata*, Haw.; and Scotch forms of *Hepialus humuli*, L., *Emmelesia albulata*, Schiff., *Pygæra pygra*, Hufn., *Hypsipetes ruberata*, Frr., and *Phibalapteryx lapidata*, Hb. Mr. Trenerry, a light var. of *Chrysophanus phlœas*, L., from North Cornwall. Mr. Manger, a very large *Vanessa cardui*, L., the unusually fine band containing a white spot. Mr. Perks, a specimen of *Blatta germanica*, L. Mr. Carrington, a number of large galls on a species of golden-rod, and a large water-bug, all from British North America. He also gave an interesting account of his recent visit to Manitoba, more especially referring to the flora, its similarity to the European flora, and its autumnal magnificence. Mr. Tutt read a descriptive account of his observations of *Zygæna achilleæ*, Esp., in the Alps, illustrating his remarks by a large number of specimens taken this year.—Hy. J. Turner, *Hon. Report. Sec.*

Birmingham Entomological Society.—*October* 15*th*, 1894.—Mr. G. T. Bethune-Baker, V.-P., in the chair. Exhibits:—Mr. Wainwright, a small collection of Hymenoptera, made chiefly during the present year. Mr. R. C. Bradley, a small collection of Aculeates, made in the New Forest last July, which had been named for him by Mr. Saunders; it contained, among other species, *Pompilus spissus* and *Myrmosa melanocephala*. Mr. W. Harrison, insects, including *Lycæna adonis* and *L. astrarche*, taken in September last on Rodborough Hill near Stroud; also *Trochilium apiformis*, which he had succeeded in breeding from larvæ obtained at Arley in April last. He had on several occasions obtained larvæ in the autumn before hybernation, and failed to breed a specimen, but he had found these April larvæ much easier to rear. Mr. A. H. Martineau, a few insects taken at Nevin, North Wales, in September last. There were three specimens of *Syrphus annulipes*, Zett., the species which was introduced to the British list by Mr. Wainwright, on the strength of one specimen taken by himself on the Cotswolds near Stroud, in June last. There were also specimens of *Arctophila mussitans*, and Mr. Martineau remarked upon the extraordinary resemblance of this species, particularly when on the wing, to *Bombus muscorum*; he had had the greatest difficulty to distinguish them. Mr. Bethune-Baker remarked upon the unusual numbers of Syrphidæ he had seen in his garden this autumn. Mr. Wainwright said that he had also been struck by the great numbers flying in his garden, *Syrphus balteatus* and *S. corollæ* being particularly abundant. Mr. Bradley had had similar experiences, and said that in Sutton Park *Catabomba* (*Syrphus*) *selenitica*, which he had never seen in the district before, had been quite common this autumn. Mr. A. W. Walker showed insects collected this summer in Devonshire, at Mort Hoe and Woolacombe, including *Epeolus rufipes*.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*November* 12*th*. Mr. S. J. Capper, F.L.S., F.E.S., President, in the chair. Mr. W. Hewett (Vice-President of the York and District Field Naturalists' Society), read a paper on "*Arctia lubricipeda* and its varieties *radiata*, *fasciata*, and *eboraci*, &c., in Yorkshire, Durham, and Lincolnshire," in which he spoke of the older specimens of *radiata* previous to 1891, and, after giving a complete history of the present brood, stated that he believed this form to be genuine, and congratulated Mr. Harrison on his success. The paper was illustrated by a large number of varieties of the various forms, besides a number of specimens, the result of crossing; Mr. Robson, of Hartlepool, exhibiting also a number of exotic species of the genus; Mr. Capper, Mr. Crabtree, Mr. C. F. Johnson, and others exhibiting fine series of the species; Mr. G. J. Porritt's intermediate forms being much admired. Mr. Crabtree exhibited a number of Scotch Lepidoptera, including *Sesia scoliiformis*, *Zygæna exulans*, *Crambus myellus*, &c.; Mr. Gregson, specimens of *Acidalia humiliata*, with continental specimens of *A. osseata* for comparison. Mr. Watson exhibited *Parnassius delius* and *P. smintheus*, with microscopic preparations of their palpi and antennæ, and stated that, after careful examination, he had come to the conclusion that these so-called varieties were distinct species. Mr. Hewett exhibited a box of varieties of *Polia chi*, including var. *olivacea*; also two olive-brown specimens of *Bombyx quercus*, male and female, from Rhombolds Moor, Yorks. Mr. Newstead, a collection of Hemiptera-Heteroptera and Homoptera, including three cases of life-histories, prepared by his brother, Martin A. Newstead, a boy of fourteen, for which he had received the Kingsley prize. Mr. Arkle, of Chester, a fine variety of *Chelonia plantaginis*, bred from larvæ taken at Winchester, and a female *Erebia blandina*, from Witherslack, with five ocelli on each primary.—F. N. PIERCE, *Hon. Sec.*

NONPAREIL [HAGGERSTON] ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Sept.* 20*th*, 1894. T. Jackson, Esq., President, in the chair.

Mr. Gurney exhibited fine specimens of *Cidaria truncata*, *Calymnia trapezina*, *Zonosoma annulata*, and *Crambus pascuellus*, from Chattenden. Mr. Cooper, living larvæ of *Smerinthus populi*, showing red dorsal spots. Mr. Lester, preserved larvæ of *Papilio machaon*, *Dicranura vinula*, *Notodonta dictæa* and *dictæoides*, *Ptilodontis palpina*, *Amphipyra pyramidea*, *Hadena pisi*, and *Anarta myrtilli*. Mr. Samson, specimens of *Catocala sponsa*, taken at sugar this year at Brockenhurst. A series of parasites and Diatomaceæ were inspected under the microscope.

October 4th.—The President in the chair. Mr. W. Harper exhibited an exceptionally light example of *Sphinx ligustri;* a unique form of *Polyommatus phlœas*, showing four orange spots on fore wings and two orange spots on hind wings; well-defined specimens of *Spilosoma mendica*, showing confluent spots; well-shotted females of *Lycæna bellargus*, and *L. astrarche* var. *artaxerxes*. Mr. Gurney, specimens of *Xanthia flavago*, *Miselia oxyacanthæ*, *Dianthœcia irregularis*. Mr. Norman, *Sphinx ligustri*, *Catocala nupta*, *Spilosoma fuliginosa;* also living larvæ of *Odonestis potatoria*. Mr. Samson, fine series of *Triphæna fimbria*, showing variations; also *Himera pennaria*, *Hybernia defoliaria* and *leucophæaria*, and *Phigalia pedaria*. Mr. Lusby, *Arctia villica*, *Smerinthus ocellatus* and *populi*, and *Sphinx ligustri*.—F. J. West, *Hon. Sec.*

The Entomological Club.—Meetings of this Club were held during 1894 as follows:—January 17th, at the Holborn Restaurant, Mr. G. H. Verrall in the chair. June 20th, at the residence of Mr. Philip Mason, Trent House, Burton-on-Trent. November 6th, at the residence of Mr. Robert Adkin, Wellfield, Lingards Road, Lewisham.—Richard South, *Hon. Sec.*

OBITUARY.

Many of our readers will hear with regret of the death of Mr. John Richard Wellman, which occurred at his residence at Clapham, on the morning of November 12th, 1894, in the sixty-second year of his age. A man of kindly and generous disposition, he made many friends, and was always ready to extend a helping hand to a beginner in the study of the Lepidoptera, to which order his attention was almost exclusively confined. For many years he was an occasional contributor to the pages of this journal, his communications consisting chiefly of short notes of captures, &c., among which were included several of *Boletobia fuliginaria* in the City of London. He was the first President of the South London Entomological Society, and occupied that position from 1872 to 1874 and again in 1883, and was elected an honorary member in 1892. During his later years he suffered acutely from the distressing disease which ultimately caused his death, and for some time previously rendered him incapable of taking the slightest exertion, and prevented him from giving attention to his extensive collection of Lepidoptera, the formation of which had given him so much pleasure in his happier days. He was interred at Norwood Cemetery.—R. A.

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